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## ACIDOSIS IN GENERAL PRACTICE.[1]

By W. E. HEWITT, M.D. (Melb.),
*Yackandandah, Victoria.*

IN presenting this paper on a complex problem such as acidosis, I am conscious of its many shortcomings. The lack of access to a large medical library is acutely felt when preparing such a paper in the country.

I shall endeavour briefly to place before you the present view of the physiology of acidosis, its occurrence in general medicine and to suggest some broad principles of treatment.

Acidosis has been defined as a diminution of the bicarbonate content or alkali reserve of the blood plasma, that is, a relative increase of hydrogen ion concentration of blood plasma.

Arterial blood in the body has a reaction slightly on the alkaline side of neutrality at the normal body temperature. The reaction for water at 22° C. in pH nomenclature is 7·0, whereas the pH for blood ranges between 7·35 and 7·43.

Any figure below 7·35 indicates an acidosis, whilst any increase above 7·43 indicates an alkalosis.

At present the determination of pH value for blood is only possible in a well equipped biochemical laboratory. It may be taken as an index of the hydrogen ion concentration. The reaction of the blood plasma is kept very nearly constant even under the most variable conditions in health and it is not certain that life could be maintained if it underwent any great alteration. There are nevertheless definite differences in hydrogen ion concentration under circumstances in which the ratio of free to fixed carbon dioxide is altered.

During violent muscular exercise there is a considerable accumulation of lactic acid in the blood, which displaces some of the fixed carbon dioxide by decomposing the bicarbonate.

Although this tendency is to some extent countered by quickened breathing, which removes carbon dioxide and so tends to restore the acid-base ratio, for a time the depletion of bicarbonate predominates with the result that the blood becomes less alkaline.

Changes in the direction of increased alkalinity of the blood occur as a result of excessive pulmonary ventilation, especially if this is not accompanied by vigorous muscular exertion. Rapid washing out of carbon dioxide from the blood disturbs the acid base ratio, giving a temporary alkalosis. It occurs where individuals are brought into atmospheres of low oxygen tension, such as high altitudes. This alkalosis is compensated by excretion of more alkali in the urine.

The constant blood reaction is maintained by a complex mechanism largely dependent on the principle of balanced solutions. Solutions of such substances as carbonic acid, carbonates, phosphates and proteins all play a part. The efficiency of the mechanism is to a great extent dependent on the relative proportions of dissolved carbonic acid and sodium bicarbonate in the blood. Within certain limits the reaction is the same whatever total amount of these substances is present. What really matters is that the proportion of carbonic acid to sodium bicarbonate should remain constant. Normally the amount of carbon dioxide dissolved as carbonic acid represents one-twentieth of the amount of carbon dioxide present as bicarbonate.

[1] Read at a meeting of the Victorian Branch of the British Medical Association on October 8, 1927.

### MAINTENANCE OF THE ACID-BASE EQUILIBRIUM OF THE BLOOD.

The means by which the acid-base equilibrium is maintained are as follows:

1. Buffer action of the blood.
2. Metabolism.
3. Renal function.
4. Excretion of carbon dioxide by lungs.
5. Ingestion of fixed bases in food.

If a solution of hydrochloric or other strong acid be neutralized slowly with caustic soda, the hydrogen ion concentration changes at first in proportion to the amount of base added, until at the neutral point there is an abrupt fall and the solution suddenly becomes alkaline. On the other hand, if we add alkali to a solution such as acid sodium phosphate, as the neutral point is reached addition of further alkali causes a relatively small change in hydrogen ion concentration.

Evidently then, solutions such as acid sodium phosphate are able to support the addition of considerable quantities of acid or alkali without there being a rapid change in the hydrogen ion concentration.

There are various salts in the blood by which its reaction is kept constant within remarkably small limits. All of them are salts of weak acids and yield alkali to a stronger acid that comes into competition with them. They are phosphates monobasic and dibasic, bicarbonates, alkali salts of hæmoglobin and to a less extent of other proteins as well. Because of this stabilizing action these salts have been termed buffer salts and are shown in the following formulæ:

$$\frac{H.HCO_3}{BHCO_3} \qquad \frac{BH_2PO_4}{B_2HPO_4} \qquad \frac{H.HBO}{BHBO} \qquad \frac{H.HB}{BHB}$$

There is a primary buffer action occurring in the blood plasma and secondary buffer action occurring in the corpuscles. When carbon dioxide is added to the blood, it mostly combines directly or indirectly with base which is set free from combination with hæmoglobin. Hæmoglobin is the chief carbon dioxide carrier of the blood, though under ordinary conditions it does not appear to combine with it directly.

It has generally been considered that neutralization of acid took place in the liver, but McLean[(2)] suggests that it is probably a function of the kidney. The kidney breaks down the urea to form ammonia which combines with acid of the blood to form a salt. By this means large amounts of the more valuable bases such as sodium are saved, the kidney retaining the sodium and replacing it by ammonia

which is excreted. S. Bliss, working in Folin's laboratory, states that ammonia is excreted from the stomach in vomiting and holds that all tissues form ammonia to neutralize acid.

He states that venous blood from most organs has more ammonia than arterial blood to those organs. Whichever view be correct, the result is the same. The presence of large amounts of acid in the body is usually indicated by the presence of a large amount of ammonium salt in the urine. This is upset where the kidneys are functionally unable to excrete the salt or where large a amount of sodium bicarbonate is ingested.

Whilst the reaction of blood is slightly more alkaline than distilled water, normal urine is distinctly acid.

It is estimated that the kidneys eliminate acid corresponding to about 3·5 grammes of pure sulphuric acid in twenty-four hours. The acid to be eliminated is brought to the kidney in combination with available base.

In the blood there is a balanced mixture of phosphates, the monosodium acting as a weak acid and the disodium phosphate acting as a weak base.

The kidney deals with this mixture and excretes monosodium or disodium phosphate, according to whether the hydrogen ion concentration of the blood is increased or decreased.

Owing to the sensitivity of the respiratory centre to alteration in the hydrogen ion concentration of the blood, any increase is attended by increased respiratory rate. The carbon dioxide content of the blood is thereby reduced and carbon dioxide of the alveolar air is likewise reduced.

### Disturbance of Acid-Base Equilibrium.

Conditions in which there is a disturbance of the acid-base equilibrium of the blood are of two kinds, alkalosis and acidosis.

#### Alkalosis.

Alkalosis, which we have defined as an increase above normal of the bicarbonate content of blood plasma, is met with in individuals subjected to high altitudes, in carbon monoxide poisoning or any cardiac or lung condition where oxygenation of the blood is impaired. The diminished oxygen tension stimulates rapid breathing, washing out carbon dioxide, giving a relative increase of alkali. The kidneys respond by excreting alkaline phosphate in urine. This is an alkalosis of anoxæmic origin.

Alkalosis also occurs where there is excessive alkali ingested, such as intravenous alkaline therapy or intensive alkaline therapy by mouth or bowel. Depletion of chloride, particularly hydrochloric acid, produces alkalosis in patients suffering from persistent vomiting.

#### Acidosis.

Acidosis, associated with acid urine, is of two kinds: (i) ketosis, (ii) non-ketone acidosis.

Ketosis usually with acidosis is seen in diabetes, chloroform poisoning, cyclic vomiting, pernicious vomiting of pregnancy, rectal feeding, carcinoma of the upper part of the alimentary tract and starvation. In all these conditions starvation with incomplete fat metabolism is the cause of the ketosis. It is generally accepted that ketosis is the result of incomplete fat metabolism owing to absence or deficiency of carbohydrate, with the result that acetone, oxybutyric and diacetic acids are present in the blood and urine.

Non-ketone acidosis is seen in uræmia, eclampsia and cardio-renal asthma and is probably due to failure of the kidneys to eliminate acid phosphate in sufficient quantity to maintain normal blood reaction. It is also seen in infantile diarrhœa and is probably due to loss of alkali in bowel secretions.

#### Recognition of Ketosis.

The tests by which ketosis may be recognized are as follow:

1. Tests applied to the urine. There are two, the Rothera test for diacetic acid and the ferric chloride test. It may be noted that a reaction is not obtained to the latter test after the urine has been boiled, whereas in patients taking salicylates or carbolic acid previous boiling does not affect the colour.

Usually ketosis is not very grave if the ferric chloride test does not yield a reaction.

2. Determination of carbon dioxide tension of alveolar air. The normal figure is between 35 and 45 millimetres. A figure below 30 millimetres suggests acidosis, whereas a figure below 20 millimetres suggests incipient coma.

3. Ammonia coefficient of urine. The coefficient is

$$\frac{\text{Nitrogen as } NH_3}{\text{Total nitrogen}}$$

It is usually $^1/_{20}$. The ammonia nitrogen is increased in acidosis, but this figure is upset if alkali is being given therapeutically.

4. Tests applied to the blood. Several tests may be applied to the blood.

The sodium bicarbonate of blood may be determined. The normal figure is about 65%, indicating that 65 cubic centimetres of carbon dioxide are bound as bicarbonate per 100 cubic centimetres of blood. This figure is reduced in acidosis and increased in alkalosis.

The hydrogen ion concentration may be estimated. Sellard's[3] quatitative plasma reaction may be obtained. Of all the tests this seems to be the one most helpful in clinical work where a biochemist is not available and will be given in detail.

The reagents required are absolute alcohol which should give no colour on evaporation with phenolphthalein and must always be tested and phenolphthalein in alcohol, 0·5%.

One cubic centimetre of serum is measured into a test tube and twenty-five cubic centimetres of tested alcohol are added. An immediate precipitate of proteins appears, which is filtered off. Care is taken to keep all apparatus dry. A few drops of phenolphthalein are added to the filtrate, which is evaporated to dryness. Normal serum turns pink and on evaporation to dryness the residue remains red, provided that it be kept hot. In slight acidosis the pink colour does not appear until the fluid has

been concentrated. With severe acidosis the pink tint is not developed at all, but the residue of the evaporation will turn red on addition of water and, if very severe, even this will fail to produce a colour. This test has been used extensively in America and is considered reliable.

#### Clinical Manifestations of Acidosis.

The symptoms common to most cases of acidosis are dyspnœa, vomiting, wasting, drowsiness and coma.

Whether these symptoms are due to actual increase of hydrogen ion concentration of blood or to specific toxic action of particular acids, is not actually decided. Administration intravenously of acids in dogs produces dyspnœa, rapid pulse, increased ammonia in the urine and diminished carbon dioxide in the blood, symptoms similar to clinical acidosis, but, whereas these symptoms are rapidly relieved by administration of alkali, in diabetic acidosis intravenous alkali is disappointing.

In the clinical detection of acidosis the following points will be found useful. In any acyanotic dyspnœa suspect acidosis. In a comatose patient test the eyeball tension. This is considerably reduced in diabetic acidosis, owing to general dehydration in hyperglycæmia.

Dyspnœa in infants suffering from severe diarrhœa suggests acidosis and urgently calls for alkaline treatment, whereas twitchings occurring in patients with persistent vomiting suggests alkalosis and calls for acid treatment.

#### Common Clinical Conditions Associated with Acidosis.

Common conditions met in general practice are diabetic ketosis, acidosis in children or cyclic vomiting and postanæsthetic vomiting. It may be helpful to consider these in more detail.

#### Diabetic Ketosis.

##### *Symptoms of Diabetic Ketosis.*

In a known diabetic the following symptoms suggest threatening coma: dyspepsia, abdominal pain, irritability, restlessness, giddiness after exertion, dyspnœa without cyanosis and drowsiness. Langdon Brown[4] calls attention to the influence of fatigue, excitement, constipation and carbuncles in inducing coma. Sepsis is probably the most common condition inducing severe ketosis.

##### *Treatment of Diabetic Coma.*

Give "Insulin" at the earliest possible moment, at least thirty units. Where no blood sugar record is available, which is usually the case in general practice, a careful watch of the patient is necessary. If there is no improvement within half an hour, repeat the dose of "Insulin."

It is advisable to keep the patient warm and administer stimulants to support the circulation.

Clear the gastro-intestinal tract by turpentine enema and castor oil by mouth. Even croton oil may be resorted to.

No glucose is given unless hypoglycæmia sets in and no food is given until recovery from coma has occurred. Then start a low diet at first giving "Insulin" about ten to twenty units twice a day as required.

When the patient improves and relapses into coma, hypoglycæmia is to be suspected. The two conditions are compared in the accompanying table.

TABLE SHOWING DIFFERENCES BETWEEN DIABETIC COMA AND "INSULIN" COMA.

| Diabetic Coma. | Insulin Coma. |
|---|---|
| Sugar in urine. | No sugar in urine. |
| Rothera and ferric perchloride tests give strong reactions. | Rothera and ferric perchloride tests do not give strong reactions. |
| Odour of acetone in breath. | Odour of acetone in breath is probably absent. |
| Intraocular tension low. | Intraocular tension normal. |
| Blood pressure low and pulse weak. | Pulse full. |
| Air hunger. | No change in respiration. |

The chief symptoms of hypoglycæmia are hot flushes, slight weakness of limbs, faintness and giddiness, sweating, tremulousness, coldness of limbs and feeling of apprehension.

Treatment is to give promptly any carbohydrate, such as barley sugar or sweetened orange juice. One or two ounces of 50% solution of glucose are readily absorbable when given by mouth. One cubic centimetre of adrenalin hydrochloride, one in a thousand, injected hypodermically is a help and acts by liberating glycogen from the liver.

#### Cyclic Vomiting.

Cyclic vomiting is the name given to a fairly well defined group of cases usually occurring in children under eleven years and characterized by sudden severe vomiting, with slight or no pain, constipation and a ketosis of varying severity.

In many cases the condition is mild and looked upon as a "bilious turn." The severest cases are usually seen in infants under three years. Thomson[5] associates asthma, urticaria, eczema and stammering with the condition and he also notes cyclic vomiting occurring in two children who had congenital pyloric stenosis in early infancy. The intervals between the attacks vary, usually weeks or months.

Vomiting is often severe and everything taken is returned. The child is drowsy, restless and thirsty, the temperature is usually raised. The abdomen is flat and retracted and is not tender. The patient looks ill, acetone is often noticed in the breath and diacetic acid is present in the urine. Where vomiting is very profuse, symptoms of alkalosis are likely to supervene and on this account it is not advisable to give alkali.

##### *Treatment.*

Treatment consists of clearing the gastro-intestinal tract by a purgative or, if this cannot be retained, by enema. No fluid is given by mouth, but 5% glucose in saline solution is given freely by the bowel in order to overcome the starvation ketosis.

#### Postanæsthetic Vomiting.

More or less vomiting after general anæsthetics has been always an accepted fact. At times this

becomes persistent and is accompanied by symptoms of starvation ketosis. This seems to be more likely after chloroform than after ether, chiefly on account of the more toxic action on the liver cells. An investigation of the urine of six hundred and sixty-two children admitted to the Great Ormond Street Hospital was reported in 1911 by Frew. The diseases were of all varieties and included injuries.

Although diacetic acid was almost invariably absent on admission, it usually appeared within twelve hours after admission in 66%. The type of illness did not have any special influence. The amount of diacetic acid increased during the first twenty-four hours and then diminished and disappeared without treatment on the fourth day. Whenever glucose was given, diacetic acid disappeared within twelve hours.

The probable explanation of this temporary ketosis is that the metabolic processes are so unstable in children that they may be upset by mere change in form of carbohydrate.

*Treatment.*

With the great success of "Insulin" treatment in diabetic acidosis it is not surprising that the same treatment should be tried in non-diabetic ketosis. For some years it has been considered good treatment to give glucose and alkali by mouth and rectum for some days prior to operation when acidosis was suspected.

Thalhimer and Perry[6] report their experience with "Insulin" and glucose in the treatment of severe postoperative vomiting. The "Insulin" causes the body to utilize rapidly the carbohydrate which is available and allows complete combustion of the products of incomplete fat metabolism. The alkaline reserve of the blood is increased and the vicious circle is cut by the relief of vomiting. Their method is to give glucose 10% solution intravenously, taking five hours for infusion of one thousand cubic centimetres. Twenty units of "Insulin" are given hypodermically one hour after commencement and one hour later another ten units. Further "Insulin" is not required in the experience of these writers.

For ordinary troublesome vomiting "Insulin" seems of no more value than glucose and alkali.

As a prophylactic measure, Potter[7] has tried the use of glucose by mouth or rectum and "Insulin" hypodermically. Where glucose was given by mouth, he allowed thirty minutes before giving "Insulin," five units, and in case of rectal infusion he allowed forty minutes.

His conclusions are:

1. That while not a specific glucose, "Insulin" is a potent remedy in postanæsthetic vomiting.
2. Results are best in cases due to acidosis and toxæmia.
3. More caution must be exercised in using "Insulin" in non-diabetics than in diabetics.
4. Absorption of glucose from the rectum is uncertain and when "Insulin" is used its effect must be very carefully watched.

**Alkalosis as a Clinical Entity.**

It is remarkable how little reference there is to alkalosis in modern textbooks. "Recent Advances in Medicine," a 1926 publication, has a passing reference from a physiological point of view. Spence[8] in *The Lancet* states that measures which lead to an alkalosis, increase the spasmophilic symptoms, while the administration of acids has a contrary effect. An example of this is the not uncommon occurrence of a case of mild latent tetany thrown into active carpopedal spasms by the administration of large doses of alkali, either by the mouth or in the process of blood transfusion.

The rôle of an alkalosis in the production of tetany is confirmed by a study of the examples of tetany in adults which may follow forced breathing and excessive vomiting. In each case the body is being depleted of acid radicles, carbon dioxide being washed out in "hyperncea tetany" and hydrochloric acid being lost in the vomit in "gastric tetany."

From a careful study of blood analysis Chase[9] draws a definite clinical picture. He states:

> Symptoms of alkalosis simulate those of tetany: twitching of the muscles, particularly those of the face (if unrelieved, convulsions develope); nausea vomiting and hiccup; dryness and redness of the skin; œdema of the extremities; vertigo and weakness; drowsiness which progresses to coma; and anuria which may cause a fatal outcome.
>
> The condition is often recognized as a result of laboratory findings. The progress can be followed both clinically and by frequent examination of the carbon dioxide combining power of the blood.

This figure is about 65% and increases in alkalosis.

Alkalosis occurs: (i) in alkaline therapy such as intensive Sippy treatment or after sodium bicarbonate given intravenously, particularly when renal function is impaired; (ii) after persistent vomiting, either from organic obstruction or in the absence of obstruction; (iii) in fevers; (iv) sometimes in the presence of ketosis.

In alkaline therapy if the absorption is slow, the body is able to decrease the rate of elimination of carbon dioxide by the lungs and kidneys will eliminate alkai and so retain the balance. Where alkali is quickly brought into the circulation, sufficient carbon dioxide cannot be retained to compensate and if renal function is low, symptoms of alkalosis will supervene.

Chase quotes the case of a child suffering from bronchopneumonia and poor renal secretion.

> The blood analysis revealed a low carbon dioxide combining power, indicating acidosis and it was calculated that thirty grammes of soda bicarbonate given intravenously would restore the figure to normal. Owing to poor renal efficiency a deep alkalosis, showing high carbon dioxide combining power, occurred accompanied by anuria and death.

An acid urine does not preclude an alkalosis. Fat is incompletely oxidized, whether the blood is too alkaline or too acid. Acetone has been detected in the breath and diacetic in the urine of a patient whose blood analysis revealed alkalosis.

In persistent vomiting there is a starvation ketosis occurring and an alkalosis due to depletion of hydrochloric acid. The treatment consists of giving dilute hydrochloric acid by mouth and if this is not retained, by giving thirty to sixty cubic centimetres (one or two ounces) of dilute hydrochloric acid in sixty cubic centimetres (two ounces) of olive oil by the bowel twice a day. Glucose 10% given intravenously in normal saline solution is helpful probably, especially when there is a ketosis as well. This treatment gives relief of symptoms and blood analysis reveals return of bicarbonate content to normal.

In the light of these observations the following clinical observations take on a new significance. Tetany has always been looked upon as a possible complication of gastro-intestinal diseases of children and it is probably those conditions in which vomiting is severe and is always regarded as a grave complication.

In acute dilatation of the stomach tetany has been observed.

Joslin many years ago laid down the avoidance of alkali in his rules for treatment of diabetic coma. McLean in his last edition of "Glycosuria and Diabetes" advises against the use of intravenous sodium bicarbonate, as it sometimes appears to precipitate a fatal issue.

Thomson[10] points out the beneficial use of salol and salicylates in cyclic vomiting. He recognizes the apparent inconsistency, as he has advocated alkali earlier in the treatment. He is quite emphatic about the benefit of giving salol and salicylates and suggests that the acid intoxication of these drugs is less dangerous than that of cyclic vomiting and may train the liver and kidney in elimination of acid products. Probably these are really cases of alkalosis.

### Conclusions.

In the absence of facilities to follow the carbon dioxide combining power of the blood plasma it is only by very careful study of symptoms of known cases that we can endeavour to apply the correct therapeutics.

It is not advisable to give intravenous alkali in ketosis, but rather give glucose and "Insulin" treatment in non-diabetic as well as in diabetic ketosis.

In persistent vomiting when there is no organic cause, alkalosis is to be remembered and glucose and acid treatment instituted. In organic obstruction after relief of obstruction acid and glucose treatment would be helpful.

### References.


[1] C. Lovatt Evans: "Recent Advances in Physiology," Second Edition.

[2] H. McLean: "Modern Methods in Diagnosis and Treatment of Glycosuria and Diabetes," page 86.

[3] Beaumont and Dodds: "Recent Advances in Medicine," page 65.

[4] Langdon Brown: "Physiological Principles in Treatment," Sixth Edition, page 292.

[5] John Thomson: "Clinical Study and Treatment of Sick Children, Third Edition, page 458.

[6] "Medical Annual," 1927, page 25.

[7] *Ibidem.*

[8] "Modern Technique in Treatment," Volume II, page 340.

[9] "Medical Clinics of North America," September, 1925, page 343.

[10] John Thomson: "Clinical Study and Treatment of Sick Children," page 462.


## THE PREVENTION AND CONTROL OF RHEUMATIC FEVER IN CHILDHOOD.[1]


By A. C. F. HALFORD, M.D., B.S. (Melbourne),
*Consulting Surgeon, Lady Lamington Hospital for Women, Brisbane.*


I SHALL not attempt to disguise the pleasure it gives me to come here this evening to address you at the invitation of your esteemed President.

The time is opportune to stimulate thought on the subject of the ravages of rheumatism in childhood. It is no exaggeration to say that the disease is devastating. Its insidious, silent working inflicts injury which frequently is ultimately mortal, difficult to discover until the great harm is inflicted.

The active campaign against rheumatism recorded in the medical journals of recent years should have its counterpart in Australia. This is one and, I think, a sufficient reason for my choice of a subject. Another reason is the tendency to reject, on evidence I admit, the influence of contagion in measures of prevention and control. Personally, for many years I have accepted the hypothesis of contagion and have acted on the assumption of case origin of the disease. Surely, if there is a suspicion, if in specific infectious diseases of which acute rheumatism is admittedly one, the factor of contagion commands consideration, we must feel keen disappointment that so little eagerness has been shown to follow up the clues, however faint.

In considering this problem we must carefully inquire into the mechanism of contagion, testing the validity of the analogy of similar phenomena in known instances. We are at once struck with the ever increasing number of examples of extension of infection from case to case, resulting from more accurate knowledge of the life history, the vectors and the portals of entry of specific viruses. The effect has been to bring into bold relief the paramount influence of the previous case.

Conformably with this advance in research environment and predisposition have faded into the background, though even today both have their strongholds, rheumatic infection being a case in point.

It has always appeared to me that we have a good working hypothesis in the belief that infection is practically unknown to result unless the virus is conveyed without impairment of virulence or loss of time from a previous case. Spore-bearing organisms, of which the bacillus of tetanus is a good example, are the only exceptions, though circumstances may permit case to case origin in this class.

[1] Read at a meeting of the Ipswich Medical Society on October 20, 1927.

If ocular proof were invariably at hand, we would find how rarely contagion is transmitted by indirect means. For all practical purposes we may disregard them and do a power of good by apprehending the red-handed culprits. In this we have the essence of what I have described as the cult of the previous case.

It is an acknowledged fact that most pathogenic organisms lose virulence very rapidly away from the host. Those that are adaptable change to a saphrophytic or vegetative existence, in which state only the most favourable conditions allow them to regain invasive powers. Artificial inoculation with or without subculture is one way commonly appealed to, but this proceeding is in no way comparable with the natural course of events.

Any organism will make the most of its opportunity when it finds itself in a site of local lowered resistance, the result of acupuncture. Infection follows injury which sometimes is fortuitous and sometimes is part of the make-up of the virus of which gonotoxin is a good example. I prefer to believe that without injury caused by one at least of these ways infection is practically impossible.

To recapitulate, I cannot conceive an organism away from its host over a long period of time, ready to spring like a snake in the grass at its victim with undiminished virulence.

The cult of the previous case asserts that the contagion carried suffers no loss of virulence and that the invasive power of the organism depends, not entirely upon itself, but also upon the pabulum carried with it derived from the host.

For want of more exact knowledge this agent is assumed to be of the nature of an enzyme and to possess proteolytic properties.

Thus, a site of local lowered resistance results from its poisonous influence, in which new soil the germ readily establishes itself. The mosquito, the fly and the flea are direct transmitters and conform to the above description, just as do cough-droplets, pus cells and infected leucocytes, especially those carrying the meningococcus and the gonococcus.

Gonotoxin, elaborated from the damaged invaded cell within which the specific organism swarms, is a powerful cell poison and this explains the ease by which a healthy urethral mucous membrane may be attacked.

By a curious coincidence the gonococcus, like the virus of acute rheumatism, can attack joint structures. It has also been known to invade the valves of the heart and to set up irido-cyclitis.

It may seem fanciful, but these several structures —joints, cardiac valves, the iris and its attachments —are homologous.

The valves are intermediate to a muscle system in the heart; the pupillary membrane, a mesoblastic remnant, is represented in the internal muscle system in the eye by the lens, its sesamoid proxy.

The elusive character of the rheumatic virus is proved by the negative results of such skilled workers using modern methods as Ainley Walker and Beattie, Cole, Horder and Bulloch, following up the distinguished researches of Poynton and Paine.

Dr. Reginald Miller, referring to this point recently, states:

> Whatever its nature it is important to realize that it is able to produce a disease which is as clearly defined as any in clinical medicine.

We shall find a promising field for the application of our cult in the conclusions of the Second Report of the Subcommittee appointed by the British Medical Association in London (*The British Medical Journal*, April 16, 1927).

The provision made therein for treatment is so full that we wonder if the Subcommittee has not entirely missed the point of reference to it. They offer mitigation only of the evil where prevention and control were demanded.

The findings of the London Committee of the Medical Research Council are no more fruitful and Dr. Reginald Miller, trying to winnow out the material facts from each of these reports, in respect of the environmental factors in the production of rheumatism on a large scale, exclaims: "The question is, how to correlate them and fit them together." Dr. Miller might have included in his survey two other reports, one from the Ministry of Health and another by the Departmental Committee of the Scottish Board of Health (1924), both dealing with puerperal morbidity and mortality. These are unanimous in saying that the factors concerned in this problem are common to the whole community, which means that environment is not one of them.

I believe that this finding is applicable to the problem of rheumatism. In the face of such equivocal evidence, it is astonishing to read in a review in *The British Medical Journal*, March 12, 1927, the following statement:

> The most hopeful line is improvement of the environmental condition of the poor so that they approximate to those in institutions where rheumatism is less common.

The disease is widespread and has no respect for persons or for place. That it is a devastating disease is proved by the mortality returns, yet the conditions of environment which are commonly credited as favourable to its incidence are not prevalent in this country. In spite of this fact, there is no disease here nor in the United Kingdom in which environment is regarded so insistently as a factor of prime importance. The report of the Subcommittee shows how profoundly it has been influenced by this single factor, but has discovered little that is conclusive of its effects.

There has ever been a tendency among sanitarians to give undue prominence to environmental influences in studying diseases of obscure origin. Environment may add to or mitigate the severity of a specific infection, but when there is aggravation, this is usually the result of secondary causes, such as mixed infections fostered by the surroundings of the patient. Even so, case origin of these complications must be thought of. Environment retires as knowledge grows.

As an example, let us go back to the days before Manson and Ross and compare the mental attitude of medical men then towards malaria with that of today in rheumatic fever. I do not suggest, of course, that there is anything in common with the mode of infection of these diseases, except that, as in malaria, a means for the transference of fresh virus must exist. It is reasonable to treat with circumspection the individual who harbours the infection, actively or quiescently.

In one of my old medical books there is a description of the experiences of a garrison stationed at a place surrounded by swamps. These were drained and cultivated because they were nasty damp places. Thereafter, the ravages of malaria diminished in a most remarkable way. It was noticed that those who were engaged in the work of draining suffered most. This was merely the result of concentration of hosts and susceptibles giving easy work to the intermediaries and was no concern of the environment, unless we admit the biological factor is embraced thereby, which I for one do not. In the course of time the swamps were allowed to fill up again and that is the end of the story and of the garrison which history relates was killed by the wet places and the night air.

Similar places are being raked over and searched for the cause of rheumatism today, those that are damp having a slight preference over those that are wet.

Someone one fine day will ridicule this search as surely as we can with our superior knowledge sympathize with the little garrison away back in the early 'eighties, the personnel of which slept without mosquito-nets.

In 1883, the British Medical Association appointed a subcommittee called the collective investigation committee and their third report is on rheumatism. It is an interesting document and was published in *The British Medical Journal* in 1888. Referring to "locality" as a factor in the incidence of the disease, they remark:

> It is a general opinion that rheumatism is more prevalent in low and damp localities and it is certainly surprising that by far the greater number of cases (in 24·92%) occurred in a "high, dry, exposed" locality and that, on the other hand, only two cases out of 646 in which data exist in the tables, occurred in a "damp, confined" locality . . . . the result of examination of the above list being that no facts of real value come out under this head.

The Subcommittee of today has come very much to the same conclusion. Of precipitating causes of an attack there is great unanimity. Cheadle (1889), Thomas Horder (1922) practically say the same thing, namely, "exposure, fatigue and damp" are the factors mainly.

We read exactly the same words in the description of the onset of acute diseases like pneumonia and nephritis. We must realize that the sequence of events depends upon the stirring up of a focal infection by a "surge," hæmostatical, induced by extraneous activation in the shape of the factors mentioned. A breaking through by this surge of the infiltration ring at the base of ulcers or minute abscess cavities (focal) results in a generalized form of infection with the usual constitutional disturbances, with a tendency to concentrate in selected organs or tissues. A "primary" infection is then recognized, to conform to the classical description of the textbook.

Still clinging to the bogey comprehensively termed environment, the London Committee of the Medical Research Council, in a report on "Social Conditions and Acute Rheumatism," finds in effect that:

> On the whole the data collected do not justify any conclusive evidence of contagion, though many of them are consistent with this view. (*The British Medical Journal*, March 12, 1927.)

Much of the evidence, indeed I think all of it, which relates to the origin of infection is divided up between environment and family predisposition, the sturdy twin bogeys of the epidemiologist, who went to school with the grandfather of Hippocrates.

Dr. Reginald Miller who has done such yeoman service in the problem of rheumatism, sums up the reports of the committees of the British Medical Association and the Medical Research Council in *The British Medical Journal* of May 28, 1927, at page 952.

He points out that the Medical Research Council report made contagion a special subject of inquiry and Dr. Miller regards the verdict as one of "not proven" rather than "not guilty." The British Medical Association report, he says, "made scant reference to the possibility of its spread by contagion."

This attitude towards the subject is to my mind strategically unsound. No harm will ensue if we accept the possibility and a great deal of good must follow preventive measures adopted in consequence. Dr. Miller states that by accepting the fact of contagion "the whole of our treatment of the disease will require alteration." By "treatment" I presume he means measures of prevention. Why not alter them? Of what avail are existing measures from the strictly preventive point of view?

Going back to the observations of the old clinicians and I do not despise them, Cheadle said that rheumatism runs remarkably in families, which fact he ascribed to hereditary predisposition. He found that in his own statistics 40% of the patients gave a history of the disease in near blood relations. He quotes Goodhart's figure as 60%. Emmet Holt gives 66%. Cheadle gives the following details in support of heredity:

> Out of 492 cases of all kinds, both medical and surgical, among the in-patients at the Children's Hospital at Great Ormond Street, in which the history in regard to the occurrence of acute rheumatism in the family was carefully inquired into, it was found that there was a clear history of its previous occurrence in near blood relations in 173. Of these 173 with rheumatic family taint, 38 or 20·2% developed unquestionable rheumatism. If chorea and the minor rheumatic manifestations were admitted as evidence, the proportion would be considerably higher. Taking next the remaining 319 of the gross number of cases, medical and surgical, where there is no history of rheumatism in the family, 15 only have developed rheumatism, *id est* 4·7%.

From these figures we are told that a child with a positive family history runs five times the risk of

becoming infected as the child of parents free from rheumatism.

These figures, of course, are not so large as those of the report published last March, which have there been interpreted as proving that rheumatic infections attack several members of one generation rather than transmission from one generation to another. This conclusion leads nowhere; for instance, it does not dispose of the possibility that the younger members of the family may have acquired infection from their elders.

Later writers pay less attention to this important relation and in some it is not even referred to. My own figures are high for two reasons: I have, where possible, made exhaustive categorical and clinical inquiry and I have certainly included chorea and the minor manifestations which were in my opinion sufficiently definite. Leading questions sometimes obtain the answer looked for, but very few of the cases investigated failed to yield convincing particulars. I was out to look for evidence of infection, others have mostly been seeking the influence of heredity, which after all is of little help in the cause of prevention and counts for nothing in treatment. My pursuit was no half-hearted one, but gave me something tangible to talk about to anxious parents.

I estimate that nearly 70% of private patients gave positive histories.

Since writing the above I have been interviewed by a patient who had rheumatic fever in Guy's Hospital in 1883 at the age of seven. Her history is clear as to her parents, but her son, aged twenty-two years, has had three attacks of acute rheumatism and, of course, suffers from endocarditis. He was born in sunny Queensland. The mother is the victim amongst other things of cardiac dilatation consequent upon a severe mitral valvular lesion.

So my figures remain unaltered. I am criticizing without an opportunity of discovering how the condition of the progenitors as to rheumatic taint was determined by the authors of recent reports, but of all the traps that are laid for the unwary family physician, I know none so dangerous as history taking not backed up by clinical evidence.

Very often patients have no knowledge of the nature of previous illnesses and more often have forgotten those of childhood's days.

We must remember also that a severe rheumatic infection in a child or adolescent may have been labelled something else by the doctor. Subsequent events have extracted such a confession from me, why not from others?

To be certain in our inquiries we must supplement them by clinical examinations of all members of the family and any blood relations or other occupants of the household long in residence therein and, if possible, by reference to a former medical attendant, if any.

The following is a recent example of the difficulties which may confront us.

I was consulted by a man of forty-eight whose complaint was very obscure. I noted that he had a definite mitral bruit and inquired if he had ever had rheumatism. He denied it. I referred the case to a physician who reported that the patient's history was clear in reply to questions by the sister who takes his patients' histories, and to himself. Subsequently the patient sent me a message that he had just recalled the fact that at the age of thirty-four he was ill for three months with rheumatic fever, a circumstance he had quite forgotten.

I eagerly followed up this clue to establish infectivity, but the family history was a blank. His parents were both alive and over eighty and his brothers and sisters were all healthy. My last resort was to ask if he had ever been intimately associated with any person who suffered from rheumatic fever. To my delight and astonishment he stated that he had volunteered to nurse a pal of his when twenty-three and in the "bush" for four months, taking the most of the duty to relieve the wife. His friend has had a subsequent attack and is now quite invalided from heart disease.

My patient harboured the infection for eleven years before he succumbed to it, which is a common period of latency in all cases investigated. I mean to take the first opportunity that offers to examine his children. It must be admitted, however, that the risk of infection to children is greater when the mother rather than the father is the sufferer and such has been my experience.

It is interesting to note that the patient under review ascribes his attack to fatigue, exposure and damp. He was droving cattle on a very hot day, early in which he had to swim a river, remaining in his wet clothes all day. Within forty-eight hours his focal infection had become general. If he had harboured a pneumococcus he would have gone down with pneumonia, if a streptococcus of the scarlatina type, acute nephritis would have supervened, and so on. No doubt the triple factors named, damp, exposure and fatigue, are powerful predisposing causes, but they have no influence in determining the specific nature of the indisposition they precipitate.

This is the only case in my experience where the history of exposure to infection occurred, apparently for the first time, late in life. His tonsils have atrophied and no clue was discovered of any focus. Of course, I realize that this case is only a particular instance, but it certainly presents features of great interest, especially the definite prolonged exposure to infection which I claim is a necessary antecedent to contagion. It is also unusual to hear of a man acting in the capacity of a nurse over so long a period. It is in the "bush" we find the highest developments of mutual aid and the true Samaritan spirit. His droving act surely did not originate his attack. It is more reasonable to accept as a fact that he acquired the infection while nursing his friend. We have in this case a rare exception to the usual course of events—infection acquired in adult life.

Applying his description to rheumatic infections, I recall that Horder states: "Rheumatic fever is preeminently a disease of pubescents and young adults." In the Harveian Oration of 1889 Cheadle said this and more. It is to this author we are indebted for the knowledge that, while rheumatic fever is a disease of young adults, rheumatic infection is extremely common in early life and that arthritis is not a frequent nor early manifestation.

The whole story of the evolution of the disease may take years of life to complete as a clinical picture and only then by the onset of a typical attack is its true nature discovered. The infection is probably ten years old, thus the idea of contracting it from a parent is so remote as not to be thought of, recent exposure to a chill or dampness is suggestively recalled as a satisfactory explanation of an event that has taken years to evolve. The suggestion is readily accepted by the subcommittees of today as of old.

Authors tell us that serious and classical forms of the disease are met with in all classes of practice in persons between the ages of twenty and thirty years. The children of such a parent are exposed during the whole period of childhood to the risk of infection and probably least of all while the parent is ill in bed. There again the notion of infection does not intrude. The mother, for instance, has her first attack of rheumatic fever at thirty, having been an active carrier of rheumatic infection all her life practically. If at the age of twenty-nine, one or more of her children show signs of rheumatic infection, the family history would be declared healthy.

There is a close resemblance in the evolution of rheumatic infection and tuberculosis sown in early childhood, then developing into a systemic disease and finally revealing itself after a number of years as a definite pulmonary lesion with the added terror of a mixed infection. The infant acquires his tuberculous infection in the arms of his consumptive mother, less commonly from the male parent, but only after repeated infection and reinfection and by massive doses.

At one time this tragedy was ascribed to family predisposition or to environment. We have taken a step forward in the comprehension of the problem of tuberculosis, but still lag behind in our ideas of the cause of rheumatic infection.

In a thoughtful and practical address to a combined meeting published in the "Transactions of the Australasian Medical Congress (British Medical Association), Dunedin, 1927," Dr. G. J. Blackmore concludes with the following propositions:

1. Tuberculosis is essentially a disease contracted in childhood; the adult is relatively immune to the infection; the disease which shows itself in adult life is in the great majority of cases a recrudescence of a disease contracted in childhood.
2. Infection takes place almost entirely indoors. It is, therefore, the home conditions during childhood with which we must deal if infection is to be prevented . . . .

It is to be noted that "the home conditions" refer to the presence therein of an infected person. If you substitute rheumatism for tuberculosis, you have what I mean.

Dr. Reginald Miller writes the review on rheumatic infection in the "Medical Annual" of this year, page 429.

I shall take the factors tabulated by this reviewer *seriatim* and begin with "Environment *versus* Heredity." I am glad he has come to the conclusion that "inheritance is not an all-important factor . . . ." I acknowledge its influence in its true biological sense and in no other.

In regard to "Environmental Factors," after all the observations that have been made, it is incomprehensible to read that: "It is well known that the disease is essentially one of school years." This is not the whole truth. It is a disease that is recognized essentially during school years, in the form of heart disease usually, which can mean only that infection is planted before school age when its earliest signs and symptoms are difficult to trace.

The factor of climate comes next after age and the preponderance of rheumatism in temperate zones is not remarkable except that these parts of the world have a denser white population than the rest. Density of population favours increase of virulence.

Under the question of "Distribution in England" infection is stated to be more prevalent in the colder and wetter northern and western parts of England. If contagion is a factor, we would expect this to happen. Children are compelled to seek the shelter of the home to a greater extent and so give greater opportunities to contagion.

In parentheses I may mention that overcrowding has not been clearly established as a predisposing factor, but conditions are operating there that are not clear and I am not satisfied that the proofs forthcoming are convincing.

"Industrialization" is inseparable from overcrowding and it is regarded as an important factor in the incidence of the disease.

"The disease is most prevalent in the industrial towns, less in residential towns, and least in rural areas." Surely density has a say in this result? We should also consider the influence of the habits of the industrialist. The labourer who harbours infection, keeps it in a more active state than the sedentary worker, especially those infections that affect the upper part of the respiratory tract.

In regard to "poverty," the consideration of this factor leads the reviewer to conclude that malnutrition, underfeeding, overcrowding, excessive dirt and other associations of gross poverty are not of great importance as predisposing causes of rheumatic infection. Well then, what have we left? Contagion?

In regard to "housing," I cannot be convinced that dampness of houses is a factor of great moment. The disease is very prevalent in Australia, yet damp dwellings are most uncommon in the Commonwealth. In any case inquiries have made it difficult to establish dampness as a constant factor. We may class it as a predisposing cause of importance, but if we define the actual cause, these secondary influences come to nought.

In regard to "School Environment," we read that "there are more children obviously diseased by rheumatism at the end of their school career than amongst entrants . . . ." The factors of exposure, fatigue and fear are laboured under this heading and much that is contradictory is met with. Let us think in terms of contagion—of the influence of the previous case.

The Medical Research Council report supplies some very interesting facts relating to Poor Law

institutions. The investigation concerns some 1,800 children who have been removed from the lowest stratum of the poor in which rheumatic infection, we are told, is less in evidence than in the higher or artisan class. The incidence of the disease among these children is practically abolished by their removal from their homes. I think I have as much justification in saying that this result follows removal of the children from sources of direct infection in the home as to ascribe it to any environmental influence. It must be noted, too, that in other schools, attended by children from their homes, rheumatic infection is common.

In discussing contagion in this connexion, it is stated that:

> No evidence of "infection" from one case to another could be found in any of the schools visited. (Poor Law schools are referred to.) In hospitals the disease is not seen to spread.
>
> The theory of possible contagion is apparently attractive to those who are now beginning to study rheumatism from the standpoint of public health; it is important, therefore, to state candidly that there is no such tradition on the side of clinical medicine. The British Medical Association Committee which issued the first report was composed entirely of hospital physicians experienced in the rheumatism of children and they passed the possibility of contagion over as of no practical importance. With this they were at one with hundreds of other physicians up and down the country. Is it likely that for years they have been studying a disease that was really infectious and they did not know it? If it may be said without impropriety, the interest in the disease at St. Mary's Hospital has always been particularly keen, as becomes the school of Sibson, Broadbent, Cheadle, Lees, Poynton, Paine, Symes, Coombs and others; we know nothing of its infectious nature there.

It is certainly staggering to stand up before such an array of talent indicated by the names given above, but I feel that I must protest with all respect that though no one has seen infection spread from one case to another, one would hardly expect anything the kind so obvious, any more than in phthisis or leprosy.

"No evidence of infection from one case to another could be found in any of the schools visited. In hospitals the disease is not seen to spread." This manner of presenting the problem suggests that contagion, in the minds of most men, is an obvious and patent process. Cannot we conceive that, in rheumatism, it is subtle, insidious and insinuating? We will not see the operation of this slow poison in the relation of school-fellows nor among the fellow-patients in the wards of a children's hospital. From all the evidence it appears to do its deadly work in the home and among the helpless children of afflicted parents.

Bearing in mind the slow and insidious onset of the disease, we must be prepared to believe that infection is planted before or at the commencement of the period of second dentition and is coincident with the adenoid reaction syndrome of dental caries, tonsillar hypertrophy and adenoid overgrowth, the fatal period of child life from respiratory affections and the exanthemata.

By the time school age is reached by the survivors, a proportion of cases have developed sufficiently to show the nature of the early harm inflicted. During school life and up to puberty and adult life, successive crops of cases appear, the development in which has been slower. Cases so developing during school life give colour to theories of school infection. Some children may run a risk of infection from schoolmates, but the chances are not so great as the relations at school are not so intimate as in the home.

Boys entering the great public schools in England and elsewhere do so in a state of good health; no family doctor would recommend a rheumatic child for admission, nor any one suffering from occasional attacks of "pyrexia of unknown origin." I also make the guess that any child who developed invalidity at school from this cause, would be removed to more sheltered places to complete his education. If the circumstances are as I relate, I am not surprised at the claim made by Dr. Atlee with regard to Eton (*The British Medical Journal*, October 20, 1923) that rheumatic infection is rare among the boys. My rejoinder is: *Ex selectione, floreat Etona.*

Oral infections, in which I include those of the teeth, the tonsils and adenoid tissues generally, are the most easily disseminated of any that affect the person, by speaking, feeding, kissing, coughing and sneezing, particularly to the child. The first three are intimately concerned with parenthood. The consensus of opinion points to the tonsils as portals of entry and they are therefore residual foci of rheumatic infection. It is, indeed, more than reasonable to fear that contagion spreads during these tender ministrations, especially those that are maternal, to the very young off-spring.

It is significant also that just as the tonsil is an organ of childhood, so rheumatic infection is acquired in very early life.

The great Trousseau described a rheumatic form of tonsillitis and ever since his day the association has been recognized.

Proof of this connexion has been sought in the results of the operation of therapeutic tonsillectomy. The guilt of the tonsil does not seem to be clearly established when we remember that it is during the last ten or fifteen years that the number of victims to the guillotine has been legion and every year sees an increase, yet the incidence of rheumatic fever is as high as ever.

There are many reasons why the evidence is unconvincing. The infected tonsil, when first seen, usually has a history of months or even years behind it and the ill-health complained of is more probably the result of constitutional disturbance from an evolutionary generalized infection rather than from the primary focal disease.

So we learn that the removal of tonsils may be followed by disconcerting results which we are frequently compelled to associate with the operation of a two-edged sword even though the instrument be blunt. Neither will it suffice to look upon the tonsil as the only portal of entry of the specific virus. As with the gonococcus, the mucous membrane is the first point of attack, so that the teeth, nasal accessory sinuses, sphenoidal sinus, middle ear and

mastoid cells by juxtaposition are possible primary sites of focal infection. Tonsillectomy will be of no avail under these conditions.

On the "safety first" plan the infected tonsil should be removed under any circumstances and in my opinion this is especially indicated whenever they are discovered to be acutely inflamed, just as we would not hesitate to remove the acutely inflamed appendix or excise a carbuncle. Why should we wait for a follicular tonsillitis to subside when we know that annihilation of an enemy at his base means an end to all depending on it? The operation is easy and the relief dramatic.

As a measure of prevention it is not advisable to allow a child after tonsillectomy to return to its home at once, if rheumatic infection is known to exist there or even suspected.

If we do not admit case origin in rheumatic fever, we still have a duty to control the real harm resulting from secondary infections, remembering that focal infections, of common sorts may, like the specific infections, have their case origin.

Mixed infections undeniably break down the natural high resistance man enjoys against acute rheumatism. Without the preexistence of common varieties of septic foci one is almost tempted to believe that infection would not occur in many cases, neither would the major disease progress in the destructive path in which it is so often featured.

Rheumatic infections, uncomplicated, as seen in the joints, cause no anatomical changes as a rule. A specific inflammatory hyperæmia of the synovial membrane is the extent of its pathology. After running a definite course the condition subsides and the internal structures of the joint return to normal. There is little or no opportunity for the entry of mixed infections in these situations.

How different is the case of rheumatic inflammation of the valves of the heart? A site of local lowered resistance, of local stasis, is established in the structures projected into the eddying stream in the heart cavities, the circus of the great hæmic thoroughfare, along which may pass occasional intruders of a bacterial nature.

It is not necessary to assume for the latter any special virulent properties nor any specific power of invasion of healthy structures. They may be nothing more than saprophytes which have accidentally gained admission and in the ordinary course of events would be annihilated and excreted. The damaged tissues of the valves are, however, an easy prey to them. Here, indeed, is "a breach in Nature for ruin's wasteful entrance." The injury is carried deeper by the mixed infection, the products of whose activity are sufficiently poisonous to adjacent healthy cells to excite infiltration at the base of minute ulcers. These in time may become confluent, partly cicatrize and by contractures distort the valves affected and render them incompetent. In the meantime, the wayfaring cocci have acquired definite virulence if they had not already possessed it. What was originally an uncomplicated inflammatory affection that would wax and wane, is changed to a destructive ulceration in no way resembling the primary morbid state, because the situation is one exposed to the risk of secondary infection. Septic corrupting focal infections, we assume, are to blame, whereas in pulmonary tuberculosis and gonorrhœa corruption comes from without. In any case the scale is turned against the patient, protracted illness if not death resulting.

The association of a mixed infection is characteristic of the diseases mentioned and is of interest to us especially in regard to rheumatism and gonorrhœa. The persistence of the infection and the tendency to recurrence are almost entirely due to the presence of a secondary infection, which, as we know too well, never confers immunity and this fact may explain the tendency to relapse and to recurrence in diseases usually so complicated.

It is remarkable that the secondary infection may sustain all the clinical features and at the same time obscure the cause. If in uncomplicated acute rheumatism resolution is the rule, is it not likely that the same tendency to spontaneous cure exists in uncontaminated gonorrhœal infections? It would appear to be well worth while to make every endeavour to protect the patient, whatever the disease, from such a danger and I think a lot could be done in that direction. Mixed infections are often the gravest danger the sick must face and we recognize in them at last the terminal infections of Osler.

It is clear then, if we are to get anywhere in solving the problem of the prevention of rheumatic fever and of control of its contaminating allies, we must commence our studies among the infants.

There is the most promising field for investigation, there we can study the earliest signs and symptoms, which Mackenzie taught was the secret of success in obscure medical problems and set us a most brilliant example of the truth of his words.

So far, clinicians admit that the first indication we get of rheumatic infection in the child is valvular disease. This is a clear intimation that we are not dealing with early signs and symptoms, but with a deep-seated and relatively old-standing complaint. It is evident that opportunities for useful research and investigation have been missed; the pathology of the disease has been obscured by evolutionary changes in a specific virus which is notoriously pleomorphic and involutionary as well as being disguised by contamination with mixed infections.

We can overcome this obstacle to research only by catching the patient while he is young. Some form of voluntary notification of rheumatic taint in parents is one way. The offspring can then be subjected to a close scrutiny from birth and every deviation from the normal in health noted and recorded for future reference. In this way it would be possible to determine prodromal signs and symptoms that would throw light on the point of entry of the virus and thus pave the way for the recognition of its true nature.

The eugenically inclined would suggest an educational propaganda among newly married couples. It is not uncommon nowadays for a young man to

present himself for medical examination as to his fitness to enter the bonds of matrimony, less frequently in my experience is advice sought by his lady. Absorbing interest is shown by these people when you discuss with them some points in their future marital relations and child welfare, upon which subjects they are always profoundly ignorant yet intensely impressionable. Here is a grand opportunity for the Commonwealth Department of Public Health to bring out one of their special monograph publications setting out in plain language advice on the prevention and control of infection in childhood and even by appropriate and discrete language the facts in relation to tuberculosis and cancer. I shall not attempt to offer a syllabus for the brochure, but I think at least we may try and get in before the purveyors of patent foods who scan the birth notifications in the daily papers and flood the new home with samples and literature for the use and delectation of new born babies. I admit that there are difficulties; we want no scare headlines, but reassuring advice and an invitation for the recipient to come back for more.

The cost of this educational propaganda would be considerable, but easily estimated from the Registrar-General's returns. A charge to cover the cost could be made and, failing that, a tax could be levied on the "best man" and his bachelor friends.

Above all, no reference to predisposition to disease should be mentioned to blight the future of these young lives. The factors of contagion are contagia, so let it go at that.

I will attempt to make a wide survey from the vantage point of the summit of observed facts of the nature of the virus and of its portal of entry.

Among a host of bacteriological investigators there is an overwhelming majority who believe the virus to be a streptococcus and to distinguish it from the many known strains name it the *Streptococcus rheumaticus.*

Looking from our vantage ground, let us ask why this conclusion is not acceptable. Perhaps the conjecture is too obvious; we cannot see the wood for the trees.

The constitutional disturbance disclosed by the temperature chart and the critical sweating is identical with common forms of streptococcal infection. Pathologically the disease is a form of streptococcal septicæmia of intermittent type. No immunity is conferred by an attack and serological tests present the same difficulties as are met with in septic diseases.

Although the organism frequently gains entrance in large numbers to the systemic circulation, pyæmic abscess is practically unknown. The so-called streptococcal pyæmia is not a true pyæmia, because pus formation does not follow infection, unless the organism is identical with those of common wound infection, such as members of the pyogenic group. Our tentative rheumatic microbe belongs to the salivary and fæcal groups which are not pyogenic.

Rheumatic fever appears to be a variety of septic infection, the symptoms and signs of which are conditioned by the previous *habitat* of the virus and by the portal of entry. It will find lodgement chemotactically in those structures which it is predisposed and predestined to attack and which can offer the least resistance.

We find as a matter of fact that the location is uniformly one on the fringe of a blood supply, where the tissues are nourished by endosmosis, such as joint structures, cardiac valves, the circumferential structures of the crystalline lens and the brain substance fed by end arteries. All other tissues seem to be highly resistant to infection. The complicating lesions of gonorrhœa show a similar inclination.

If we can establish the truth of Rosenow's researches, the above definition may be accepted for what it is worth.

We must not neglect to ascribe to the portal of entry of the germ of rheumatism some influence in the subsequent behaviour of the organism within the host.

I shall consider the tonsil as the accepted site of primary focal infection coupled with the office of protection against infection so freely ascribed to it.

From our vantage ground again what can we see in evidence of this beneficent function?

I think we can argue just as well that the tonsils are vulnerable points in the defensive system of the child. That an attempt at resistance is offered I shall admit, but then resistance is a natural and inherent attribute of all parts of any living organism and therefore of the tonsil and its lymphatic ramifications. These adenoid structures are loosely knit and dwindle in the absence of disease so that they disappear in adolescence. Otherwise they mark the sites of successful invasion by an enemy who may still be working harm within their gates. The adult does not need them for protection, so that I think we must find greater justification for the presence of tonsils in the infant than defence.

These organs have quite a list of specific infections which unhappily can grow luxuriantly upon them. I fear they are less like buttresses of defence than the weakest points thereof.

It would be just as logical to look upon the urethral mucous membrane as a first line of defence against the onslaught of the gonococcus; the defensive reaction is there as sufferers can relate with the disorganization of a one-way traffic route impossible anywhere else in the body.

It requires no stretch of the imagination of the arm-chair philosopher—and I admit that I am one—to say that rheumatism conforms in every way to the description of diseases of an infectious nature and that the virus according to the cult is transferred from one case to another. This may not be readily accomplished, but follows as the result of continuous and intimate contact such as is provided in family relations or their equivalent. The invasive power of the organism is probably low and resistance high, as in tuberculosis, with which disease there is much in common.

The full range of Koch's postulates is incomplete, but so that we may act on the conviction, I suggest that we let off at "half" Koch rather than lose the valuable time required to formulate practical measures for the prevention and control of the disease.

We shall fire the first shot and whether it hits the target or follows some path not yet closed to error, has still to be determined.

My proposition is that the factor concerned in rheumatic infection, common to the whole community, is contagion. This is likely to be described as guessing at the truth. It is no idle guess, but the kind the dictionary describes as "an attempt to solve by a correct conjecture."

"But now is time, I gesse, homeward to go."

## ANDREW JOHN BRADY.[1]

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IT is usual for the retiring president on an occasion such as this to read a paper bearing upon the work of our specialty and the progress and advances made during the time he occupied the chair as your president.

I had thought of following these well marked footprints, but on reconsidering the matter I thought the greatest event which had happened to our Section during the past year was the loss we all experienced by the sudden and unexpected death of our first president and founder, Dr. Andrew John Brady, on August 25, 1927. Holding this view, which I know you all share, I thought that my address as retiring president should pay some small tribute to the man we all admired.

Andrew John Brady was typical of the best class of Irishman. Born in 1849 in the north of Ireland, he came of a race of sturdy landowners, that admirable stock which through ages has stood for freedom of opinion and to which the greatness of our Empire is largely due.

Brady was educated at Enniskillen and during his early boyhood showed his mind to be more inclined to scientific and classical pursuits than to the simpler and at that time more lucrative opportunities of landed proprietorship. He left school with a sound knowledge of the classics which gave him no small advantage in the early stages of his medical career. He studied medicine in Dublin and in due course qualified in 1872 at the early age of twenty-three. He immediately became resident medical officer at various hospitals, notably at the Rotunda, where he gained his large experience in midwifery and gynæcology and at Sir Patrick Dun's, where he devoted himself chiefly to surgery and medicine. In common with all the older generations of surgeons he believed that anatomy was the foundation upon which all success in surgery must be built, so during his spare time and after he ceased to be a resident medical officer he taught anatomy in one of the Dublin schools, as he himself once told me, "in order that I should not forget it." Brady was a student till the end of his life and it was no uncommon occurrence to find him reading a well thumbed edition of Quain's "Anatomy," full of marginal notes of his own.

After qualifying, feeling the need of rest, he decided on a pleasure trip to Sydney to visit his uncle, Dr. Moffatt, who was in practice here. Like so many of us he came to look, but eventually decided to stay. He joined his uncle in general practice and later was appointed one of the earliest resident medical officers to the Sydney Hospital, eventually succeeding to the post of a visiting surgeon.

At the risk of being tedious may I be permitted to draw your attention to the position which surgery and medicine occupied in the early 'eighties of last century, when Brady was a junior surgeon, so that you may realize just what were the conditions under which these men did their work. Listerism was just beginning to be practised. It was considered that all the requirements of antisepticism, as opposed to asepticism, which was then not quite understood, were met if the instruments were immersed in a 5% carbolic acid solution and a spray was kept continuously discharging a similar vapour upon the seat of the operation. Carbolic acid poisoning was not unknown. Suppuration was expected more often than not, an old term "'laudable pus," still used to describe it, was in common use. Dressings were changed frequently and the wound and parts handled far too much, being usually drenched with iodoform at every dressing. There were no X rays to help the surgeon distinguish between fractures, dislocations or sprains; he had to depend solely upon his anatomical knowledge and clinical experience.

Medicine was in an equally (to us) parlous condition. There were no pathological or biochemical departments and a growth had generally to be classified as malignant, tuberculous or innocent, according to the knowledge and skill of the physician. Blood counts as we know them were unknown. Of the nursing staff for the most part it is charitable to say little, but they did their best under disadvantageous circumstances.

Our own specialty was indeed the Cinderella of the profession. Here in Sydney it must have been much as in every large centre of medical education. Little if anything was known about diseases of the ear, nose or throat. Cerumen was removed and the nose sprayed. But the majority of the patients coming to hospital for treatment were relegated with joy to the junior surgeon, who in turn passed them on to anybody who was kind enough to accept them. Even Joseph Bell, about this time Conan Doyle's teacher and the original of Sherlock Holmes, used to say: "Gentlemen there are a few diseases of the ear which are curable, wax in the external meatus

[1] Read at the annual meeting of the Section of Oto-Rhino-Laryngology of the New South Wales Branch of the British Medical Association on November 30, 1927.

and perhaps middle ear deafness, of the kind which is relieved by blowing your nose—other aural maladies are incurable and may be sent to a specialist." For just about that time, the early 'eighties, ear, nose and throat specialists were beginning their useful and necessary careers.

Brady saw the vast field in this direction waiting. Australia was full of adults suffering from running ears and children with tonsils and adenoids.

He visited Europe and met and worked with St. Clair Thompson, Dundas Grant and Felix Semon, pioneers in laryngology. He also attended Politzer's clinic in Vienna and to the last maintained his intimate friendship with this grand old man, a man who knew many tongues and like Bacon "took all knowledge for his province."

On returning to Sydney he persuaded the directors of the Sydney Hospital to establish an ear, nose and throat department and this was the first I believe in the southern hemisphere; Brady, resigning his position as general surgeon, was placed in charge.

How he worked in that special clinic and of all he did there I need not remind you. It was no uncommon thing for him to be at Sydney Hospital till nine or ten at night to see all his out-patients. People flocked to his clinic from all parts of Australia. He had later as assistants, Dr. Hankins, whom he recommended for the position at the Royal Prince Alfred Hospital after he himself had decided to remain with Sydney Hospital, Dr. Camac Wilkinson, Dr. Spiers Kirkland and many others equally well known who now practice our specialty. Dr. Kirkland could, I am sure, tell you many incidents connected with the early days of the department in Sydney Hospital, before the introduction of the bronchoscope. Then the surgeon who wished to remove a foreign body from the bronchi, opened the trachea and with a pair of forceps groped for the object and strange to say he occasionally succeeded in getting it.

With the advent of the mastoid operation Brady made a second visit to Europe and came back well qualified to perform this new and then dangerous operation. Later, his meeting with Killian imbued him with courage to treat diseases of the frontal sinuses radically by an open operation. To those of us of a more recent generation there seems nothing striking in this; neither is there now in flying, but just think of the uncertainty connected with aviation less than twenty years ago and you will realize the feelings of our pioneers. When Blériot flew across the Channel he waited for many days for a favourable wind and ships were waiting to pick him up in case of disaster. He eventually just managed to reach Dover, twenty miles from his starting point. What would Sir Alan Cobham think of such a journey now? At the time this was considered a wonderful record making performance. It is on record that Lawson Tait was threatened by the coroner that an adverse verdict would be returned against him if he continued to remove ovarian cysts and the patient died. In other fields of our specialty Brady showed his ingenuity and resource. He was one of the first surgeons successfully to remove large naso-pharyngeal fibromata and his original operation is now a classic. He was also the pioneer to recognize that a flow of pus over the choanæ was diagnostic of an infected antrum, though the nose itself might be apparently normal. In his early days cleft palates and hare lips were relegated to his department and he performed many successful operations in this field. The thyreoid gland also came within his sphere of operation and he successfully removed it on various occasions.

Some months ago Sir St. Clair Thompson reported a case in which, while introducing a hook through the bronchoscopic tube to remove a foreign body, it got caught in one of the smaller bronchi and the difficulty he had in removing it. Brady experienced a similar mishap years before, but by passing a rubber tube over the hook and getting it inside the lumen the removal was simple. In arranging Brady's papers recently I saw a letter from Sir St. Clair congratulating Brady on his idea and thanking him for the suggestion. How typical it was of him to write modestly to Sir St. Clair and not to proclaim the fact to the world in a long letter to the journal. This is only one of the many instances which during the fourteen years I was associated with him impressed me with his modesty of mind and nobleness of character.

Of Brady's interest and work in the Sydney Hospital it would be impossible to say too much. He found the nursing staff inadequate and poorly trained and recognizing the importance of highly trained and educated women in the care of the sick, initiated reforms which have resulted in the present high state of efficiency of the Sydney Hospital nursing staff. He grew up with the Sydney Hospital and when he attained the highest position, that of president, his interest in it seemed only to increase. His ambition was to see the new wing finished and the nurses adequately housed, but it was not to be. He was a very sick man when he attended the last meeting of the Board and the principal business was the new wing. He went to bed that evening and a few days later the end came.

On Brady's interest in the charitable institutions of Sydney I shall not touch, beyond reminding you that his help was never withheld and was given freely and unostentatiously. His relaxations were fishing and golf and until the last two years he looked forward to his annual holiday at the Creel. On the death of his old friend and opponent Professor Warren, Brady seemed to lose interest in golf. He greatly missed the Wednesday and Saturday rounds at Kensington together with the subsequent discussion and explanation.

There is a scheme on foot to perpetuate his memory by establishing a new ear, nose and throat department in the new wing in Sydney Hospital, complete in itself and a separate entity to be called after him. I can conceive of no more fitting tribute to the memory of the first laryngologist in Australia, "the man who blazed the trail."

# Reviews.

## AN ATLAS FOR WORKERS WITH X RAYS.

A collection of reproductions of radiograms of normal parts of the body and of typical pathological conditions and abnormalities should provide a useful work of reference, especially for the man possessing his own X ray machine, but inexperienced in radiological interpretation.

It is doubtful, however, whether it is wise to attempt to cover the whole field of radiography in a single volume, as has been done by McKendrick and Whittaker in their "X-Ray Atlas of Normal and Abnormal Structures."[1]

As might be expected, it is not a well balanced work. Possibly owing to the relative ease of reproduction, over a hundred and sixty of the two hundred and fifty pages of text are given up to the bones of the extremities—normal joints, epiphyseal formation, fractures, infective conditions, neoplasms *et cetera*. This is quite the best section. The plates showing the various stages of epiphyseal calcification in particular should be of use in preventing mistaken diagnoses of fracture.

There is little of value to be found in the volume by the experienced radiologist, whilst for the novice the letterpress is much too meagre. The absence of any indicatory marks on the plates, though stated in the preface to be intentional, must make it difficult for the uninitiated to identify many of the conditions mentioned. This applies particularly to the radiograms of the gastro-intestinal tract.

Criticism must also be directed towards the omissions. Thus though four plates (Figures 327 to 330) are presented of "modification" of the pyloric antrum or duodenal cap, said to be due to a "distended gall bladder" (an interpretation not at all obvious in three of the four), not a single example of the typical deformations of the duodenal cap due to ulcer is included.

One film, Figure 337, shows a small collection of opaque material in the "cap" area, interpreted probably correctly as an ulcer niche.

Plate 324 presents an example of "delay in the stomach" without any indication of the interval of time since ingestion of the opaque meal.

The inclusion of a film showing a patent ampulla of Vater and accompanied by letterpress stating that "this is diagnostic of a pathological gall bladder, with inspissated mucus and debris passing downwards," can scarcely be passed unnoticed, especially in association with many figures where just a word or two of general explanation would have been welcomed.

The section on nasal sinus pathological change is one of the weakest. Only six films are shown and no less than four of these are devoted to the demonstration of opaque gauze in the right sphenoidal sinus. These might have been replaced with advantage by others showing some of the more common pathological conditions. The important "chin-nose" view of the maxillary antra is ignored.

The absence of lateral views of the spinal column (with the exception of one of the cervical segment) furnishes a further striking omission.

Generally speaking, so little is shown in turn, except in reference to bone pathology, of each of the various aspects and applications of radiological diagnosis as to be of only slight value. There is not enough material for comparison.

We feel it would have been better if the authors had confined themselves in this volume to the bone work alone, postponing the radiological presentation of pathology of the other systems to some future date.

[1] "An X-Ray Atlas of the Normal and Abnormal Structures of the Body," by Archibald McKendrick, F.R.C.S. (Edinburgh), D.P.H., F.R.S.E., and Charles R. Whittaker, F.R.C.S. (Edinburgh), F.R.S.E.; Second Edition, Revised and Enlarged; 1927. Edinburgh: E. and S. Livingstone. Demy 4to., pp. 272.

# Analytical Department.

## "YEUCLIN."

"YEUCLIN" is the name given by Rocke, Tomsitt and Company, Proprietary, Limited, of Melbourne, to a dried yeast preparation for medicinal use. It is said to contain not less than 90% of dried brewer's yeast. It is offered for sale in the form of tablets. One form is mixed with a farinaceous material; a second contains in addition to the farinaceous material phenolphthalein in the proportion of 0·06 gramme to each tablet; the third form is dispensed for the treatment of diabetes and is said to contain no starch.

### The Preparation.

Our inspector visited the factory of Rocke, Tomsitt and Company, Proprietary, Limited. He reports that the factory and the machinery contained are satisfactory and clean. "Yeuclin" is manufactured in a very cleanly manner, without unnecessary handling.

The factory is small and somewhat cramped. It is stated that in a few months' time the factory will be removed to a much larger building in South Melbourne. In the new factory specially adapted rooms are being set apart for the preparation of "Yeuclin." The plans were examined and the building was visited. Our inspector expresses the opinion that the preparation will be carried out under the new conditions with greater facility and increased safety as regards the exclusion of contamination.

The yeast is obtained from a brewery in casks. It is washed repeatedly by decantation and dried in a centrifuge. The powdered material is then mixed in a machine with the starchy ingredient. Essence of cloves (0·65 gramme to the kilogram) and saccharin (one gramme to the kilogram) are added as flavouring. The mixture is dried in a specially constructed oven at a temperature not above 42° C.. The drying process occupies about four hours. The mass is then compressed into tablets in the usual machine.

The diabetes preparation is made in the same manner, but a diabetic flour or protein material without carbohydrate is employed in the place of the starch. In all cases the added matter is sifted mechanically before being used.

### Analyses.

Samples of dried yeast, the mixture after having been dried at 42° C. and the three kinds of tablets were collected for examination. In addition a sample of "Yeuclin" was purchased in the open market and analysed for comparison.

The samples were submitted to examination with the following results. Those collected in the factory and the purchased sample were examined microscopically. They were found to consist of yeast cells, *Saccharomyces cerevisiæ*, and of starch grains. An estimation of the quantity of starch gave 9·4% in the first sample and 9·7% in the second. It thus appears that "Yeuclin" tablets consist of at least 90% of yeast.

Both samples fermented a sugar solution actively. On being inoculated into wort tubes they yielded an active growth of yeast. The yeast is therefore alive. Some of the tablets were kept for five weeks, at the end of which time it was found that the fermentative activity had almost gone and that no growth resulted in the wort tubes.

The tablets containing phenolphthalein were found to be the same as the starch containing tablets. The ingredients were the same and the amount of starch was 9·6%. In addition phenolphthalein was detected.

The diabetic preparation contained actively fermenting yeast cells, but no starch. A protein was found in the mixture probably of the nature of casein.

### Conclusion.

From the above report we are justified in the conclusion that "Yeuclin" is a carefully prepared yeast product in an active state and should be of value when yeast is required for therapeutic purposes. Only fresh tablets should be used.

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# A Retrospect.

## Medicine.

TWELVE months is a relatively short time for a serious piece of research to be completed by one investigator on a single subject. But with the whole range of medicine and with the combined efforts of the medical profession it is a long period and much progress may be expected. The year 1927 has been no exception in this respect. There is a noticeable tendency within recent years for clinicians, pathologists, specialists and hygienists to meet for the purpose of discussing special subjects. This has the effect of stimulating many men to undertake investigations of one or other aspect of the selected subject independently or in small groups. The progress is therefore greater in connexion with certain subjects chosen in this manner than in connexion with medicine as a whole.

One of the diseases or groups of diseases which has attracted considerable attention in Europe and in Australia is pernicious anæmia. It would seem that true Addisonian anæmia or that form of pernicious anæmia associated with achlorhydria and arising without obvious cause is not identical with such forms as occur in women during pregnancy and the puerperium. There have been full dress debates on the anæmias in England, in America and in Australasia. It is generally admitted that the ætiology of so-called essential pernicious or Addisonian anæmia is still obscure. Hurst adheres to the view first enunciated by William Hunter of an origin in oral or other focal sepsis. Others have incriminated bacteria, including streptococci of different varieties. A number of hypotheses has been put forward in the course of these discussions and in independent publications. S. A. Smith, speaking in Sydney recently, stated that each one of these hypotheses elaborated by its author appeared to be convincing; it thus must be recognized that the real sequence of events leading to this disease has not yet been established. Reference will be made in another part of this series of articles to the hæmatological work connected with the study of the anæmias. The treatment of the condition will be dealt with under the caption of therapeutics.

A considerable amount of attention has been paid to anacidity in connexion with gastric function and with nervous disturbances. Attempts have been made to extend the significance of gastric anacidity by gauging its presence after the Ewald test meal with the aid of indicators of great delicacy. It does not follow that if the stomach is not stimulated to secrete acid, it is incapable of doing so under different circumstances. Achlorhydria occurs in persons who later in life are found to have combined degeneration of the cord or pernicious anæmia. Acid is absent from the gastric secretion in the advanced stages of gastric carcinoma. More information is being gained on this highly interesting and important phenomenon. In Australia Apperly's work has thrown light on certain obscure points and forms a valuable part of his contribution to our knowledge on gastric function. A further interesting study by Hansman, Day and Clifton on the source of the gastric chlorides deserves mention and consideration.

Tuberculosis always claims the attention of clinicians and pathologists and as in previous years a considerable amount of work on this disease has been carried out. David Perla has endeavoured to learn fresh facts concerning the epidemiology of tuberculosis by studying the conditions under which guinea pigs and rabbits are infected spontaneously by proximity and contact with tuberculous animals. His work is not yet completed, but he has been able to demonstrate that spontaneous tuberculosis does occur in guinea pigs and rabbits after long periods of exposure, even when they are kept in cages separated from the cages containing the infected animals. The incidence is not high, notwithstanding the susceptibility of guinea pigs to the disease.

Numerous attempts have been made to establish immunity to tuberculosis. Hitherto little success has attended these experiments. Evidence has long

been available that the general resistance to tuberculosis in man is acquired. It is probable that new born infants are more or less immune, but that susceptibility appears in the course of infancy. The views elaborated many years ago by von Behring and others that the almost universal invasion of human beings in Europe by the tubercle bacillus is accounted for in the following manner. Before full susceptibility is established, infants are exposed to infection and partial immunity is established. Those infants who escape invasion at the early stage, may contract acute miliary tuberculosis during childhood and succumb rapidly to the infection. Chronic pulmonary tuberculosis is held to be a second infection in a person partially immunized in infancy. Calmette has endeavoured to utilize the possibility of inducing an immunity in infants. His method is being tried in France. Its value has not yet been determined.

Ferry and Fisher have isolated a substance which they claim is the toxin of the measles virus. They used a streptococcus obtained in the early stages of the attack of morbilli. It was found that this streptococcus was agglutinated by the serum of patients convalescent from the disease. A skin test has been devised with the toxin and the latter has been used for the production of a specific antitoxin in horses and rabbits. The immunity induced by the injection of the serum of persons after recovery from an attack of morbilli is transient and on this account it is of limited value. The prophylactic injection of serum of persons recovered from poliomyelitis and scarlatina is advocated by many clinicians. Jean Macnamara and F. C. Morgan have described the methods adopted in Melbourne for the collection of convalescent poliomyelitis serum, its preparation and its application to patients during an epidemic.

F. S. Hone has again called attention to the endemic occurrence of typhus fever in Australia. The disease is mild in its course. Hone concludes that it is a place disease in some way associated with the prevalence of rats and mice. He is satisfied that the rodent is not the sole factor in the conveyance of infection. The infection is irregularly explosive and it occurs at certain seasons and in certain localities.

A thoughtful article by D. W. Carmalt Jones has directed attention to the relation of temperature to pulse rate in certain infective diseases. A study of the two curves will enable the clinician to form a better conception of the prognosis of the process.

"Lipiodol" has been used not only for the localization of spinal tumours, but also for the diagnosis and study of chronic pumonary diseases, chiefly bronchiectasis and bronchitis.

The significance of iodine in the soil in relation to the prevalence of goître has been further elaborated by C. E. Hercus and his Dunedin colleagues. Some highly instructive information has been communicated to the Australasian Medical Congress (British Medical Association), Dunedin, 1927, in this connexion.

Harold Dew has continued his work on hydatid disease and has published the results of his recent studies. His book is now in the press and will shortly be available. It is the most complete and authoritative book on this disease in the English language.

C. H. Kellaway has carried out some very useful work on renal infections. The main point brought out is that while a spread of infection upwards through the lymphatics to the kidney may occur, ascending infection is nearly always up the lumen of the ureter.

D. T. Davies has undertaken some useful studies in connexion with the function of the liver. Blood sugar tolerance tests after the administration of galactose and the estimation of cholesterol and bilirubin yield a reliable indication of hepatic function. G. King advocates the use of lævulose prior to the estimation of the blood sugar. He claims that hepatic deficiency can be recognized by the result of the sugar tolerance tests.

The glands of internal secretion still claim the attention of many clinicians, especially in America. While much work continues to be undertaken, a great deal of the published matter is quite unreliable. There is apparently a large sale for glandular extracts of all kinds, but it is extremely doubtful whether any of these extracts with the exception of thyreoid extract and adrenalin have any physiological action in the presence of pathological changes.

## Surgery.

THE hundredth anniversary of the birth of Lister, the father of modern surgery, has proved much more than a mere excuse to do honour to the memory of one of the world's greatest men. The centenary celebrations held in all parts of the world have recalled many forgotten or little known details of the master's life. This reminder of progress has stimulated surgeons to contribute something to surgical knowledge and to advance the cause of humanity. It seems almost as if this important event has been responsible for more good work and for better work in 1927 than in the years immediately preceding it.

Mention has already been made in another part of this retrospect of the foundation of the College of Surgeons of Australasia, an event fraught with far reaching effects for good. The object of the College is to raise the standard of surgery and the standing of surgeons. It is a concerted effort and the inevitable result will be to draw together the surgeons of all the States of the Commonwealth and of the two portions of the Dominion of New Zealand. Its success lies in the womb of time; if its Fellows devote their energies to its objectives, there should be no doubt concerning the part it will take in the development of surgery in Australasia. The past has provided the evidence of the capability of our leading surgeons.

In the year 1927 few subjects have been studied more intensely than malignant disease. It would be a mistake to concede that cancer is essentially a surgical subject. It has today a surgical aspect. Perhaps that aspect may disappear in some future time, as more information is gained concerning the ætiology and pathogenesis of the diseases collectively called cancer. The present ignorance of the essence of these diseases renders it necessary to submit every patient as soon as the diagnosis can be made to operative treatment or to treatment by irradiation. Lockhart Mummery writing of rectal cancer admits that colloidal copper has effected some cures. Blair Bell's colloidal lead treatment may prove more beneficial. W. R. Day has made out a good case for the hypothesis that the alleged increase of cancer is apparent rather than real. He has shown that as a larger number of people survive to middle age, the number of candidates for the disease is relatively increased. The number of deaths from cancer among each hundred persons of any age group with the possible exception of the group of women at the climacteric, does not appear to have increased during a period of ten years. If cancer is a disease of late middle age and old age, while the number of deaths in the whole population will increase as more people live to the cancer age, the increase may be due to a larger supply of susceptibles. This matter must be investigated more closely, as it is obvious that the same laws are not likely to obtain in connexion with carcinoma of the uterus, carcinoma of the breast, carcinoma of the rectum and epithelioma of the lip.

The stomach and duodenum continue to attract surgical workers. H. B. Devine has called attention to the necessity for collaboration between the surgeon and the radiologist in order that the differential diagnosis between gastric ulcer and gastric carcinoma may be rendered less difficult. The same author has given a very valuable account of the proper employment of gastro-enterostomy. For many years difference of opinion among surgeons has existed concerning the indications for this operation. Its employment under unsuitable conditions has done much to discredit the operation. Devine's contribution will have the effect of restoring confidence in gastro-enterostomy by causing surgeons to recognize what can reasonably be expected of it. B. M. Fried has endeavoured to improve the diagnosis of primary carcinoma of the pancreas. While certain signs, such as an unusual form of colicky pain associated with diarrhœa, but not with jaundice, are almost diagnostic of pancreatic neoplasms, they are rarely recognized and are often absent.

Recent advances in the understanding of the function of the gall-bladder and of the various forms of jaundice have had a considerable effect on the surgery of this organ. Some sound work has been undertaken in regard to the prognosis of operation for the removal of gall stones. It has been shown that under modern conditions, provided that the operation is not performed late in an attack, the mortality is low and prospects of com-

plete cure are good. Much improvement in results has been effected as a result of accurate diagnosis. Cholelithiasis often resembles renal disease and spastic nervous symptoms may also simulate it. Unless these conditions are recognized, unnecessary operations may be carried out.

Ramisection is becoming more securely established as a standard operation. Apart from N. D. Royle's original indication of spastic paraplegia, he has employed it with remarkable effect in Hirschsprung's disease, in Raynaud's disease and in *thrombo-angiitis*. The opposition to the work of Royle that has been evident in England, is weakening and no doubt will soon disappear. In close connexion with this is the subject of the relief of pain by surgical means. R. Leriche holds out hope that the future treatment of *angina pectoris* will be sympathectomy. The French school apparently prefers more drastic procedures than those advocated by Royle. It would seem to be doubtful whether chordotomy will survive as a surgical operation.

The surgery of the spinal cord has been advanced by work carried out by Donald Armour. The introduction of the "Lipiodol" method has improved the surgery of spinal tumours. Armour is of opinion that careful localization by ordinary neurological means is safer and sounder than the injection of iodine in an oily fluid. Others, however, have found that the risks are negligible and that the radiographic control of the diagnosis is far more reliable than indirect signs. The work of J. F. Mackeddie may be mentioned in this connexion.

While the division of the posterior nerve roots for the relief of lightning pains of *tabes dorsalis* is an old operation, many bold modifications have been introduced within the past few years. Section of the antero-lateral tracts of the spinal cord and even the complete division of the spinal cord have been undertaken for intolerable pain, with considerable success. Godwin Greenfield has introduced a new operation for the relief of pain in certain nervous conditions and in inoperable malignant disease. It consists in the longitudinal section in the middle line of the spinal cord at a level somewhat higher than that corresponding to the area to be rendered analgesic.

At the second session of the Australasian Medical Congress (British Medical Association) in Dunedin the subject of the surgical treatment of goître was thoroughly discussed. The surgery of hydatid disease also found a place on the programme. H. Dew has contributed fresh facts and L. Barnett has also published valuable case records of the operative difficulties in the removal of colossal cysts of the abdomen.

A highly instructive and valuable discussion on the treatment of empyema was held in Melbourne. R. M. Downes and W. A. Hailes have not only given a clear account of the modern views on this subject but have contributed out of their own experience to the surgical teaching.

C. E. Corlette has published many articles in the course of the year. All are of value in advancing knowledge. Special mention should be made of his articles on malleolar fractures and on irritable ulcer of the leg. In the latter he places a common condition in a new light and establishes its pathology.

In the foregoing questions of pathology have been left untouched. This is reserved for the chapter on morbid anatomy. Much work has been carried out on the pathology of tumours and disease which belong to the realm of surgery. For example, there was some important original work brought before the congress at Dunedin on the tumours of bone. Some of this work lies midway between pathology and surgery. M. Kolodny has dealt exhaustively with the subject of the sarcomata of bone and has cleared up some obscure points. The work of Keith Inglis also deserves mention in this respect.

The injection treatment of varicose veins is being discussed by many surgeons in all parts of the world. Those who have used this method, speak of it in enthusiastic terms.

### Neurology and Psychiatry.

AN event of the year was the delivery by Harvey Cushing of his address on acromegaly to the Medical Society of London. Although mainly surgical, the address contained much of medical interest, indeed the whole field of pituitary disorders was covered. It may be rated as the most finished pronouncement

on the subject ever given. The mass of material analysed, no less than 416 cases, would have staggered a former generation and may never be paralleled.

*Encephalitis lethargica* has again received special attention. One interesting point brought out by Ivy Mackenzie, of Glasgow, is that a history of successive epidemics in that city indicates a change of type not recognized in any other inflammation of the central nervous system. This is illustrated by the observation that whereas in the epidemics of earlier years lethargy was a dominant opening feature, in later years this symptom was replaced by excitement and perhaps choreiform agitation and later again by mild initial symptoms and severe sequelæ. Observers in other countries have agreed with this finding. In the clinico-pathology of the disease a dogmatic statement from Greenfield, of London, is worth noting. It is that the only laboratory examination giving guidance in diagnosis is that of the cerebro-spinal fluid which usually in the first few weeks of the disease shows a mononuclear pleocytosis. Regarding chronic encephalitis, the statement has been made by Riddoch, also of London, that no one knows when the patient is cured; we are at a prognostic impasse.

Turning to other diseases, that indefatigable histologist Marinesco writing from Paris has suggested that amyotrophic lateral sclerosis is due to a pathogenic agent, at present unknown, introduced from without and affecting intracellular colloid media. The same writer claims that in *herpes zoster* the primary infection is peripheral and cutaneous and that from skin the virus ascends the nerve trunk to the posterior root ganglion. An objection to the accceptance of this idea is that in all cutaneous surfaces there is sensory overlap. To abolish sensation in one spinal root area three roots must be cut (Sherrington). In *herpes zoster* the typical lesion is not triganglionic, but monoganglionic.

In disseminated sclerosis certain characteristic mental changes are insufficiently recognized. They consist of effective and physical sense of well-being and undue optimism. Of these Cottrell and Kinnier Wilson write and their terms euphoria, eutonia and *spes sclerotica* are apt.

So many successful results in the malaria treatment of general paralysis of the insane have been recorded that this method is now universally accepted. It may be mentioned, however, that during the year two other procedures, intravenous injections of "Stovarsol" and injections of typhoid vaccine, have been advocated as equal with the malarial method.

On the subject of lunacy law and attendant discord between the medical and legal professions there has been more discussion. A comparison between English and Scottish law drawn by Professor Robertson, of Edinburgh, is illustrative. Under Scottish law the position of the medical profession in the management and treatment of persons of unsound mind is paramount; in England and Wales (this applies also to Australia) it is subordinated to an erroneous legal conception concerning the liberty of the subject and the fear of improper detention which has helped to mislead a public whose ideas about mental disorders remain mediæval.

At the recent Australasian Medical Congress, held in Dunedin, a number of important papers were read and discussed. The subjects included further results in the treatment of spastic paraplegia by ramisectomy, the localization of spinal tumours with "Lipiodol," the examination of the cerebro-spinal fluid, mental deficiency, criminality, delinquency and the physical basis of mental disorder.

In Australia the year has brought a series of useful contributions to our knowledge. Clunies Ross gives grounds for the belief that in tick paralysis nerve cells of spinal anterior horns and cranial nerve nuclei are chiefly involved. Lind, from a clinico-pathological study of Huntington's chorea discounts the supposition that meningo-encephalitis is the basic lesion. Evan Jones, Minogue and Constance D'Arcy have enlightened the world on the mental disorders of the climacterium in women. Bostock has written on the causes and characters of mental deficiency and finally Badham, having elaborated a new method for determining the presence of lead in the urine, has published a comprehensive, critical and instructive report on lead poisoning.

# Abstracts from Current Medical Literature.

## BACTERIOLOGY AND IMMUNOLOGY.

### Skin Reactions to Pneumococci.

RUSSELL D. HERROLD and EUGENE F. TRAUT (*Journal of Infectious Diseases*, May, 1927) report their findings in an investigation into the skin reactions induced by pneumococcal extracts and filtrates. A type I pneumococcus was used in the investigation and the filtrates were obtained from five-day dextrose-phosphate broth cultures containing 0·1% dextrose and 0·1% dibasic sodium phosphate in nutrient broth from which the sodium chloride was omitted. The filtrate was diluted to one part in five with physiological salt solution and injections of one-tenth of a cubic centimetre were made. Approximately 73% of the patients suffering from pneumonia yielded no reaction to the pneumococcal filtrate, while 85% of other patients yielded a reaction. Three-quarters of the reactions obtained developed within twelve hours and the maximum was usually reached after eighteen hours. In a series of pneumonia patients who did not react to the pneumococcal filtrate, almost all reacted to filtrates of *Bacillus typhosus* and *Bacillus coli*. The results of neutralizing and protective experiments indicate that failure of skin reaction depends on specific substances which have developed in response to the infection.

### Blood Sugar and Malarial Infections.

MARY STUART MACDOUGALL (*American Journal of Hygiene*, September, 1927) discusses the effect produced in malarial infections in birds by changing the sugar content of the blood. Bass found that the addition of sugar to the culture media is necessary to insure successful cultivation of malarial parasites (human) and Bass and Johns had successfully cultivated the parasite in the blood of a diabetic without the addition of sugar. The author concluded as a result of the experimental work carried out on canaries infected with malaria that the increase of sugar content in the blood produces a condition favourable to the parasites, while a decrease in the blood sugar content produced by the use of "Insulin" creates a condition unfavourable to the parasites.

### Skin Reactions in Helminthiasis.

FRANCIS M. RACKEMANN and AMOS H. STEVENS (*Journal of Immunology*, June, 1927) suggest that the intradermal injections of the extract of other helminths might prove as useful in diagnosis as does the extract of echinococcus. They report the case of a medical student whose skin accidentally came in contact with some of the body fluid of *Ascaris suillis* with which he was working. Immediately a large urticarial wheal spread over the anterior aspect of the forearm and caused intense itching. No history of round worm infection could be obtained. Intradermal injections of extracts of *Ascaris lumbricoides* and *Ascaris suillis* later promptly produced an urticarial wheal in each instance. In testing the student's blood for the presence of reagins two normal subjects were used. Twenty-four hours after intradermal injections of the student's serum the sites in the normal subjects were treated with extract of ascaris and in both subjects reactions were obtained. In one the control site treated with ascaris extract without previous injection of the student's serum showed a distinct reaction and restlessness with general urticaria and itchiness developed. Of three other individuals tested later with ascaris extract two yielded reactions.

### Antigens in Enteric Vaccines.

J. A. ARKWRIGHT (*Journal of Pathology and Bacteriology*, April, 1927) has investigated the antigenic content of different variants of the typhoid-coli group and has attempted to correlate the efficacy of prophylactic vaccines made with different variants or by different technique with the antigen content of the variants. Vaccines prepared with *Bacillus paratyphosus A.* and *Bacillus typhosus* were used in the experiments. Four variants of *Bacillus paratyphosus A.* were obtained, a smooth motile, a smooth non-motile, a rough motile and a rough non-motile. Two variants of *Bacillus typhosus* were obtained, a smooth and a rough. Vaccines prepared with rough forms were found to give comparatively slight protection, while those prepared with the smooth forms were found to yield efficient protection. The vaccines heated at 53° C. for seventy minutes and then at 100° C. for thirty minutes were found to be as protective as those only heated at 53° C. for seventy minutes. Rough forms of members of the group of organisms are unsuitable for use in the preparation of vaccines and high virulence associated with the smooth forms and heat stability in cultures used is essential.

### Streptococci in the Human Throat.

C. IRIS FOX and DORIS M. SMITH (*Journal of Pathology and Bacteriology*, April, 1927) record the results of an investigation into the changes in streptococcal types of the human throat throughout the winter months with a view to determining whether very definite relationship between these changes and pathological conditions could be established. The Holman grouping of the streptococci was adopted. *Streptococcus mitis* and *Streptococcus salivarius* were the only two groups commonly met as normal inhabitants of the throat and 81% of all the colonies examined belonged to one or other of these groups. A definite constantcy in the flora was maintained and fluctuations which did occur, had apparently no relationship to any pathological condition. The appearance of hæmolytic streptococci appeared to bear definite relationship to local pathological conditions. In a few instances hæmolytic streptococci appeared unassociated with any evident lesion, but in almost every case in which this group appeared, a lesion developed. The two most common types of hæmolytic streptococci recovered were *Streptococcus pyogenes* and *Streptococcus anginosus*.

## HYGIENE.

### Determination of Comfort Zone.

C. P. YAGLOU (*The Journal of Industrial Hygiene*, June, 1927) has conducted certain experiments to determine the comfort zone for men at rest and stripped to the waist. Sensations of comfort, as far as the warmth of the atmosphere is concerned, are not fixed. They vary considerably according to the activity of the individual, the kind and amount of clothing worn, the seasonal variation in weather and the kind and amount of food consumed. On account of these variables it is impossible to fix a single temperature as a standard of comfort which will hold under all conditions. To solve this problem a temperature zone must be determined which will be wide enough to include the effect of these variables. The present experiments were conducted in the psychrometric chamber of the Department of Ventilation and Illumination, Harvard School of Public Health. A modern air conditioning equipment installed in a room adjoining the psychrometric chamber furnishes air conditioned to the desired temperature and humidity. Sixteen tests were made which yielded a total of 2,976 opinions on sensations of comfort. In eight of the tests the relative humidity was maintained at 30%, in the other eight 70%. Eighty-five men participated as subjects. The subjects stripped to the waist before entering the test chamber. In the chamber they sat comfortably in chairs and read, wrote or conversed. Every ten minutes they were asked to express their sensations of warmth according to the following scale: (i) Cold, (ii) comfortably cool, (iii) very comfortable, (iv) comfortably warm, (v) too warm. The author summarizes the results. The comfort zone for men at rest and stripped to the waist has been found to lie between 18·8° C. and 27·8° C. (66° F. and 82° F.) on the effective temperature scale. The most probable optimum appears to be 22·5° C. (72·5° F.). These values take into consideration both diurnal and seasonal acclimatization. Diurnal changes in adaptation to atmospheric conditions were accounted for by keeping the temperature constant for one-half to three-quarters of an hour before recording the subjects' sensations of comfort. This period seemed to be sufficient to overcome the effect of

previous environmental conditions in the case of men stripped to the waist. Seasonal changes in adaptation to climate were accounted for by carrying out experiments both in summer and in winter. The failure to discover evidence of seasonal acclimatization may proceed from either of two causes: the summer data may be too few or the seasonal changes in adaptation to climate may be smaller than the experimental error. Clothing was found to affect the comfort zone considerably. At a relative humidity of 50% the probable optimum temperature in winter was 21° C. dry bulb when ordinary indoor clothing was worn and 27·8° C. dry bulb when men were stripped to the waist. When the subjects were dressed according to the season, there was a variation of about three degrees centigrade dry bulb between the summer experiments at this laboratory and the winter experiments of the Pittsburgh laboratory. This comfort zone for men at rest and stripped to the waist is superimposed upon the thermometric chart designed at the Pittsburgh laboratory. By means of this new chart the relative comfort of ordinary atmospheric conditions can be determined when the dry and wet bulb temperatures and the velocity of the air are known.

### Difficulties in the Campaign Against Tuberculosis.

B. T. J. GLOVER (*The Journal of State Medicine*, June, 1927) discusses the difficulties to be overcome before the mortality from tuberculosis can be reduced. It is obvious that any failure or postponement of notification for a considerable length of time after the onset of the disease will lead to a failure to provide sanatorium treatment or to take precautions against spread and will result in the ineffectual use of the elaborate machinery for treatment at the disposal of most public health authorities. During the year 1923 inquiries were made into 1,239 deaths from tuberculosis and it was found in connexion with 278 or 22% no notification was received before death took place, in 159 or 13% the notification was received within one month of death, in 422 or 34% the notification was received within twelve months of death, while in the remaining 380 or 31% the notification was received over twelve months before death. In 22% it was impossible, therefore, in the absence of notification, either to afford the patients adequate treatment or to take steps to prevent them from being a danger to others with whom they lived in contact. In the face of these figures it is not very surprising that the task of diminishing the incidence of tuberculosis is proving to be a very difficult one. The reasons for these high figures of missing or delayed notifications may be stated as follows. The patient may fail to attend a doctor because of a gradual onset of illness which is unnoticed, a mistaken idea that the disease will disappear without medical attention, the fear of being sent to a sanatorium if consumption is diagnosed or the necessity for continuing at work for financial reasons. The medical practitioner may fail to notify infections because of his inability to make a diagnosis through hurried examination or lack of skill; he may yield to the patient's request to omit notification; he may forget or he may believe incorrectly that the infection had already been notified by another doctor. Tuberculosis is an ailment which runs a long course before complete recovery or death ensues; it almost invariably results in a prolonged inability to work. Active steps are needed *inter alia* for the assistance of the dependants of those patients who are under institutional treatment, for the provision of suitable employment for those sufficiently restored to health to be fit for work, for steps to increase the earning capacity of the whole family by change of employment of the individual members thereof, for the rearrangement of the home or help to secure a more suitable home so that the patient's health may be maintained and the danger of home cross infection minimized and for financial assistance. It is always difficult to place damaged workers in employment in ordinary business undertakings while there are healthy workers to choose from. The present shortage of housing accommodation is a very serious factor in the spread of tuberculosis infection. The danger from a consumptive patient rises in proportion to his proximity to his fellow creatures. There are many families whose sleeping accommodation is limited to one or two rooms and under these conditions the presence of a tuberculosis member is a very grave danger.

### The Storage Battery Industry.

ALICE HAMILTON (*Journal of Industrial Hygiene*, August, 1927) considers the making of storage batteries (electric accumulators) to be a lead trade accompanied by more than the average risk of lead poisoning because of the presence of large quantities of lead oxides and also, though to a lesser degree, because of fumes of lead from kettles and from lead burning operations. She describes the conditions found in nine large factories in the United States, four in England and one in Germany. In factories in the United States from 7,000 to 8,000 men are employed in lead work. The problem of protecting the employees from lead poisoning is far from simple owing to the nature of the work and it requires provisions for the prevention of lead oxide dust and lead fumes, for personal cleanliness of the workers and for proper medical supervision and treatment of the individual. One American company reports that in 1918 when conditions were most unsatisfactory, there were ninety-six attacks of recognized lead poisoning, an average of eight per month among one thousand employees on the pay roll. Records for the first nine months of 1926 (under new management) reveal a total of nine attacks, an average of one a month among 1,350 on the pay roll. Another American company in 1924 had an annual rate of 15% of the employees affected, while in 1926 this rate had been reduced to 2·4%. A comparison between the industry in the United States and in England and Germany shows that the advantages on the side of the two latter countries consist in the greater proportion of stationary batteries manufactured there, which means less exposure to lead oxide and the higher standard of governmental sanitary control which is based on expert knowledge and enforced by competent inspectors. The advantages on the side of the United States consist in the greater use of mechanical devices to displace hand work, the general use of oil or electric heat instead of gas or coal and the very small number of women and lads employed.

### The Need for and Use of Controls in Hookworm Inquiries.

CLAYTON LANE (*The Journal of State Medicine*, August, 1927) holds that for the proper study of ancylostome infection the use of satisfactory controls is essential. Controls can be satisfactory only if applied to each separate factor concerned. A near approach to single factor control will be obtained by selecting a group of infected persons and comparing their original condition with that which is revealed at an adequate time after disinfestation. Disinfestation may be measured by energy, by capacity for work and for earning and by lessened morbidity and mortality. The determination of the ovum content of the fæces is difficult of certain attainment. The search of the stool after an anthelminthic has been acclaimed and accepted as an exact method, but in fact it is nothing of the kind. For instance, washing fæces after an anthelminthic will not infrequently disclose fragments of partly digested worms and again female hookworms only may be found, although the eggs detected in the fæces are fertile. There are two other methods for determining this content. The first is that when the ovum content is found to be habitually below thirty, a single female is normally ovipositing. The second is the examination after death of the fæces from the rectum for eggs and of the washings from the whole intestine for worms. Although it is uncertain whether the minimum ovum content for *Necator americanus*, *Ancylostoma duodenale* and *Ancylostoma braziliense* is identical, there can be little hesitation in accepting the conclusion that in any of these species it lies above twenty. The author considers that the direct centrifugal flotation is the best diagnostic technique to adopt. This method subjects the centrifugal precipitate of a watery suspension of the fæces to centrifugal flotation in a tube of special character on the mouth of which lies a cover glass. This is lifted off and the fluid which comes with it, is examined as a hanging drop.

# British Medical Association News.

## SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at Wangaratta on October 8, 1927, DR. R. G. MCPHEE, the Vice-President, in the chair.

The afternoon session took the form of a series of clinical demonstrations by members of the North-Eastern Subdivision.

### A Pneumonic Lesion.

DR. G. V. DAVIES presented a female, aged twenty-four years, who had been well until three weeks previously. She had then complained of cough and had felt out of sorts. There had been no sputum.

On examination signs of consolidation had been discovered over the whole of the left lung, more definite in the apical regions and in the axilla. At the base of the right lung there had been slight dulness and a few *râles*. The temperature had been 38·3° C. (101° F.). A skiagram had shown consolidation of the whole of the left lung, with no cardiac displacement and no alteration in position of the left diaphragm. At the time of presentation there were still signs of consolidation over the whole of the left lung. The temperature was 37·2° C. (99° F.) and the general condition of the patient was fairly good.

Dr. Davies commented on the lowness of the temperature and the good general condition of the patient, in spite of the extensive consolidation. He regarded the condition as being probably tuberculous and asked for an expression of opinion with regard to diagnosis and the advisability of inducing artificial pneumothorax.

DR. H. FLECKER said that in very advanced pulmonary tuberculosis the skiagram usually showed consolidation with cavity formation in the apical portions of the lungs and spread of infection towards the bases which were usually air containing and inclined to be emphysematous. In such extreme cases changes were usually present in the opposite lung. He thought, therefore, that the condition was probably not tuberculous. The X ray appearances were those of consolidation with perhaps some fibrosis.

DR. A. V. M. ANDERSON stated that in view of the absence of cardiac displacement there was no empyema. The sputum if obtainable should be examined frequently for tubercle bacilli and the blood examined by the Wassermann test. In the meantime the condition should be regarded as being probably tuberculous and treated as such.

With regard to artificial pneumothorax in pulmonary tuberculosis, there were two schools of thought, one advocating that in all cases the lung should be compressed as soon as the diagnosis had been made and the other adopting a more conservative attitude. He thought that in the case presented, the consideration of the advisability of artificial pneumothorax should be delayed until the diagnosis was more definite.

DR. J. R. WILLIAMS said that the facial appearance of the patient, almost a typical "frog face," strongly suggested some upper respiratory infection. He thought that the condition was not tuberculous, but an example of that rather rare disease unresolved pneumonia. He quoted a somewhat similar condition in a patient who had been ill for five months with cough and signs of consolidation in the lung, but very little sputum. He had made a complete recovery. He thought that in the patient presented the prognosis was good.

DR. LESLIS HURLEY said that in all the cases of acute pneumonic tuberculosis he had seen, sputum containing tubercle bacilli had appeared, usually in about a week's time and always before three weeks. He was inclined to agree with the diagnosis suggested by Dr. Williams. If the case were one of pulmonary tuberculosis, the lung should be compressed without delay as it had been shown that artificial pneumothorax was most valuable in these cases.

DR. W. N. DAVIES agreed with the diagnosis of unresolved pneumonia. He had seen a patient who for several months had had signs of consolidation in the whole of one lung which had gradually cleared up.

### Urethritis.

Dr. Davies's second patient was a male, aged fourteen years. He had received a blow on the penis about four centimetres (one and a half inches) from the *glans*. Two days later a purulent urethral discharge had appeared and had been accompanied by some scalding on micturition. At the site of the blow a small swelling had appeared. This had been incised but no pus obtained. Bacteriological examination of the discharge had disclosed *Staphlococcus aureus* and a spore forming organism. In view of the presence of the latter an autogenous vaccine was not prepared. Treatment by means of a stock vaccine of *Staphlococcus aureus* had been instituted. The temperature curve had then become of a swinging type. An abscess had developed in the perineum. This had been opened and pus had been discharging from the wound for seven weeks. No instruments had been passed and there had been no signs of urinary obstruction. Dr. Davies thought that the injury had probably caused a rupture of the mucous membrane of the urethra with resulting spread of infection into the periurethral tissues.

DR. DAVID ROSENBERG said that a urethritis due to staphlococci was not at all uncommon and responded well to irrigation with mercuric oxycyanide (one in four thousand). If a tight foreskin were present, circumcision should be done. Treatment with colloidal manganese and vaccines was of no value.

MR. VICTOR HURLEY said that he had always regarded with suspicion a purulent urethritis in a young man which had apparently followed an alleged injury. The condition was probably gonococcal in origin. He had made a rectal examination and had found that a prostatitis was present. He thought that the abscess in the perineum had probably been a prostatic abscess. A gonococcal complement fixation test and further examination of urethral smears would establish the diagnosis.

MR. ALLAN HAILES thought that the condition was a gonococcal urethritis. He thought that the first swelling had been due to periurethral infiltration and the second to a periurethral abscess.

### Arterial Thrombosis or Embolism.

Dr. Davies's last patient was a female, aged forty-one years, who in April, 1926, had given birth to a still-born baby a few weeks after a motor accident from which she had apparently made a complete recovery. Ten days after the confinement she had developed a venous thrombosis first in the right and later in the left leg, after which both lower limbs had remained considerably swollen. Later, down the calf of each leg there had appeared a red, itchy, scaly rash, which had been pronounced by a skin specialist to be due to either pellagra or syphilis. The skin all over the body had been dry and thyreoid extract had been administered. The blood had failed to react to the Wassermann test. Sudden severe pain had then appeared in the left arm which had swollen considerably. Later no pulse could be felt in the left arm which was thinner and colder than the right. Examination of the heart had revealed nothing abnormal. A skiagram had shown bilateral cervical ribs and bilateral chains of calcified cervical glands. At the time of presentation the general health of the patient was good and the circulation of the left upper limb was improving. Dr. Davies thought that an arterial thrombosis or embolism had occurred.

### Hip Disease.

DR. W. H. GODBY showed a boy, aged nine years, who had been first seen on August 15, 1927. He had been well until three days before, when he had complained of headache and vomiting. On the following day he had vomited again, had been slightly drowsy and complained of pain in the right thigh. The temperature had been 38·3° C. (101° F.) and there had been no pain when the right lower limb had been moved.

On August 18, 1927, the boy had been delirious and had complained of pain about the left hip joint. The temperature had been 39·4° C. (103° F.) and there had been pain

and tenderness over the upper portion of the left thigh and in the region of the gluteal fold. The delirium had lasted thirty-six hours, but the pain had persisted for three or four days longer. There was limitation of movement of the left hip joint in all directions and the limb was in a position of flexion and internal rotation. There was also one centimetre of shortening. No reaction had been obtained to the von Pirquet test. Extension had been applied to the limb. At the time of presentation there was no pain, the limb was in good position with no shortening and movement at the hip joint was free in all directions. Each evening there was a rise in temperature up to about 38·3° C. (101° F.). A series of skiagrams taken at intervals of about one week was exhibited. The first showed slight destruction of bone along the acetabular margin of the hip joint. The others showed gradually increasing bony destruction with sequestra and some new bone formation, extending into the ileum. Dr. Godby invited an expression of opinion with regard to the nature of the infection and the treatment to be adopted.

DR. A. E. TAYLOR thought that the diagnosis rested between tuberculosis and osteomyelitis. A differential count of the leucocytes might be of help as in osteomyelitis the myelocytes were frequently increased to more than 2%, while in tuberculosis the increase was slight and was below this figure.

MR. ALLAN HAILES thought that there was an osteomyelitis of the ileum, with spread of pus and granulation tissue between the two layers of the bone. The X ray appearances were in his opinion characteristic of this condition and he thought that before long abscesses would develope. He considered that conservative treatment should be continued, but later on, particularly if the condition extended and abscesses formed, operation would be necessary to obtain a cure; the outer table of the bone should be removed, diseased bone and sequestra dealt with and drainage established. He thought that the boy was very fortunate to have such good movement at the hip joint and that the ultimate prognosis was good. Osteomyelitis was not so common in the flat bones as in the long, but he had seen it occur in the ileum, sternum and bones of the skull.

MR. RUPERT DOWNES said that when he had first seen the patient a month previously, the history and clinical examination had strongly suggested a diagnosis of osteomyelitis. The skiagram, however, had shown signs of rarefaction, which rarely occurred after so short a history as two weeks and he had therefore suspected tuberculosis or sarcoma. At the time of the meeting he thought the diagnosis to be osteomyelitis. He had seen a similar case, diagnosed as appendicitis, in which the site of involvement had been the same as in the patient presented. He thought that operation should be undertaken because after eight weeks the boy still had fever, the cartilage of the joint was almost gone, sequestra were present and abscesses might form and break through into the pelvis and be very difficult of approach.

MR. VICTOR HURLEY held that there was an osteomyelitis of the ileum arising from the acetabular epiphysis. When a boy of growing age was suddenly attacked with severe pain in the neighbourhood of the larger joints, with delirium and acute toxæmia, the diagnosis of acute osteomyelitis was almost certain. He had had such a patient recently with delirium, with pain in the hip and pelvis and meningeal signs and grave toxæmia, in whom a diagnosis of some form of cerebral inflammation had first been made. Later definite signs of osteomyelitis of the upper end of the femur with arthritis of the hip had appeared. These grave symptoms were commoner when the infection was in the epiphysis about the hip joint that elsewhere. In view of the extensive nature of the disease as revealed in the skiagram it was surprising that the patient presented was relatively well and had such free movement of the hip joint after eight weeks. This was probably due to the early relief of tension. He would not advise immediate surgical treatment, but thought that sequestra should be dealt with as the necessity arose. In these cases spontaneous dislocation of the hip due to extensive destruction of ligaments was liable to occur and should be guarded against by the maintenance of extension until after all signs had disappeared.

### Severe Visceroptosis.

Dr. Godby's second patient was a female, aged thirty-four years, who had been complaining of abdominal pain from time to time for the past eight years. The pain had become worse and had been particularly severe in the right side of the abdomen. The appetite had been poor and a feeling of repletion came on shortly after even a small meal. There had at times been frequency of micturition and the urine had occasionally been cloudy. There had been no vomiting or constipation, but she had felt very tired and languid.

The lower part of the abdomen had been very protuberant. The gastric contents had contained both pepsin and free hydrochloric acid. A camp belt had been fitted and a month later she had felt much better and all symptoms had disappeared. The appetite had become good and there had been an increase of three kilograms (seven pounds) in weight. X ray examination had shown very little alteration in the position of the viscera after the fitting of the belt.

DR. NORMAN MCARTHUR thought that the belt was an excellent one. In many cases of gastroptosis a congenital factor was present. A good "lifting" belt should be fitted before the stage of extreme discomfort was reached. He also described exercises which he had found to be beneficial in these cases.

DR. J. F. WILKINSON desired to thank Dr. Godby for bringing the belt under the notice of members. In many cases a horsehair pad placed beneath the belt was an added benefit. The beneficial results of the belt were due to the fact that it supported the abdominal vessels and took the drag off the mesentery. X ray examination often showed that there was no alteration in the position of the viscera after the fitting of the belt.

### Congenital Pulmonary Stenosis.

DR. E. KIRSNER showed a baby, aged two months, who had been born after a long and difficult labour. There had been no instrumental interference and no tearing of the perineum. The baby had been cyanosed at birth, but had breathed after about ten minutes. Since then there had been attacks of cyanosis and dyspnœa, which had lessened in frequency and severity after correct feeding had been instituted. A loud, rough systolic murmur could be heard over the whole of the left præcordial region. Dr. Kirsner regarded the condition as being congenital pulmonary stenosis and commented on the deleterious effect of transitory disturbances of health on this and on other chronic diseases.

DR. NORMAN MCARTHUR said that he had seen a boy, aged thirteen years, who had previously enjoyed good health and who had suddenly been attacked with acute cyanosis with death ten days later. Autopsy had shown complete absence of the interventricular septum.

DR. LAWRENCE STOKES agreed with the diagnosis of congenital pulmonary stenosis. He thought, however, that a skiagram of the chest should be taken in order to determine whether there was any enlargement of the thymus, which if present, should be treated by radium therapy.

### Oxaluria.

Dr. Kirsner also showed a male, aged thirty-four years, who four months before had noticed burning pain in the right lumbar region, with occasional attacks of acute colic radiating into the right testis. There had been no pain on micturition and no urinary frequency. The right kidney was slightly tender on palpation and appeared to be enlarging. Microscopical examination of the urine had shown nothing more than a few oxalate crystals. Skiagrams of the urinary tract and cystoscopic examination had revealed nothing abnormal. A barium meal had shown some kinking of the duodenum and appendix, probably due to adhesions. Treatment directed towards the oxaluria, including the administration of acid sodium phosphate and magnesium sulphate, had made no difference to the pain.

### Probable Branchial Cyst.

DR. D. D. BROWNE and DR. E. KIRSNER presented a male, aged sixty years, who for the past two years had noticed

a swelling in the left side of the neck at about the centre of the right sternomastoid muscle. During the first twelve months it had at times completely disappeared, but during the past year, although it had varied in size, it had always been present. There had been no difficulty in swallowing and the size of the swelling had borne no relationship to meals. Pulsation transmitted from the carotid artery had been present. There had at times been difficulty in breathing, apparently due to traction of the swelling on the trachea. The systolic blood pressure in the left arm had been 88 and in the right 108 millimetres of mercury. There had been no alteration in the voice. X ray examination during the swallowing of a bismuth meal had shown that the œsophagus had been pushed to the right side, but there had been no obstruction. A skiagram had shown a well marked cervical rib on the right side. It was thought that the swelling was either an œsophageal diverticulum or a branchial cyst, probably the latter.

### Gastric Ulcer.

DR. D. D. BROWNE showed a female patient who had first consulted him twelve months previously complaining of abdominal pain, headaches and flushing of the face. For the past twelve years she had had indigestion of an intermittent character, the longest interval between attacks being about six months. During the attacks she had complained of pain coming on after meals, at times made worse and at other times relieved by food. She had been regarded as suffering from hyperacidity and had been treated with alkaline powders. In January, 1927, she had been seen by Dr. J. F. Wilkinson, who had advised X ray examination, which had revealed a perforating ulcer on the posterior wall of the stomach and adherent to the pancreas. A fractional test meal had shown a free acidity of 20 in the resting juice, followed by a fall in acidity and then a sharp rise to 50. The stomach had been empty in two hours. He had ordered alkaline powders and placed her on an ulcer diet, at the same time advising operation. The patient had improved rapidly on the diet and alkalis and had refused operation. X ray examination some months later had shown no trace of the ulcer.

DR. J. F. WILKINSON said that in view of the findings at the first X ray examination he had advised operation. He had previously thought that a large perforating ulcer adherent to the pancreas would not heal under medical treatment. The after results in this case had caused him to modify this opinion. He emphasized the need in peptic ulcer for thorough and intensive alkaline treatment, which should be continued for at least two years. If necessary the alkalis should be given through the night and care taken that effective neutralization was obtained. He thought that in the patient presented there was a danger of hour-glass stomach developing.

DR. W. M. BORLAND said that in 1925 he had seen a patient in a similar condition with hæmatemesis and indigestion of two years' standing. X ray examination had shown an ulcer on the posterior wall of the stomach which had been considered suitable for surgical treatment. Alkalis and a Sippy's diet had been given for a period of about six months and there had been no recurrence of symptoms after two years.

DR. F. L. DAVIES questioned the accuracy of the X ray diagnosis. It was well recognized that many ulcers would heal under medical treatment, but he thought it inconceivable that a penetrating ulcer adherent to the pancreas should heal and free itself again. He would like to ask Dr. Wilkinson's opinion on this point.

Dr. Wilkinson replied that there was no doubt that chronic ulcers could heal, but he did not know whether they ever became detached from organs to which they had been adherent.

DR. COLIN MACDONALD said that the X ray appearances in the case presented were unusual in that the ulcer crater was visible through the well filled stomach and was further than usual from the border of the lesser curvature. It was usually impossible to demonstrate radiologically the acute ulcer which had not penetrated the muscular wall of the stomach as it was the acute ulcer that most frequently caused hæmorrhage. X ray examination after a recent hæmatemesis often failed to demonstrate an organic lesion. In regard to the question of the healing of chronic penetrating gastric ulcers he had seen a patient in whom the X ray examination had shown a typical penetrating ulcer of the lesser curvature and a notch opposite to it on the greater curvature. A second examination three months later after a course of medical treatment had shown no trace of the ulcer, but the notch on the greater curvature still persisted. At a later date the stomach had been explored in the belief that an hour-glass contraction had developed and no trace of the ulcer had been found. He had also seen a patient in whom an ulcer notch had disappeared under medical treatment, but the symptoms and radiological signs had recurred. It was difficult to be sure on radiological evidence that an ulcer had healed, as the crater might become filled with blood clot, food or granulation tissue and X ray examination would reveal nothing abnormal. The investigations of Nicholas and Moncrieff, of the Middlesex Hospital, appeared to show that there was no relation between the length of history or the size of an ulcer and the rate or permanence of healing. It was also often difficult to determine whether an hour-glass contraction was due to spasm or scarring or a mixture of both. Antispasmodics such as atropine would relax spasm if it were due to extrinsic causes, but not if it were due to intrinsic lesions of the stomach or duodenum.

DR. J. J. KELLY asked Dr. Wilkinson if Hurst's contention that massive doses of alkali caused an immediate neutralization followed by a reactionary hyperacidity were correct.

Dr. Wilkinson replied that he had traced many of his patients who had been under alkaline treatment and that there had been a definite reduction in acidity. Hurst himself gave large doses of alkali.

### Cretinism and Mongolism.

DR. W. E. HEWITT showed two patients, one a cretin and the other a mongol, illustrating the differences between these two conditions.

The cretin was twelve and a half years of age and had the typical facial appearance with a large, square shaped head, widely separated eyes and bloated features. There had been no second dentition. The bones were poorly developed. The abdomen was prominent and a small umbilical hernia present. The child was able to stand, but had never walked. The fontanelle was still open. The tongue often protruded. The tracheal rings were easily palpable in the region of the thyreoid isthmus. The temperature was subnormal. The skin was dry, rough and redundant and the hair dry and coarse. The mongol was a female, aged sixteen years, who was the eldest of three children, the others being quite normal. Menstruation had commenced at the age of eleven and she had passed successfully through an attack of measles. The head was small and round, the eyes closely set and the palpebral fissures oblique. The tongue was relatively large and fissured. Sucking noises were frequently made. The development of the teeth had been delayed, some of the first dentition still being present. The skin was smooth and mottled and the hair scanty. The hands were small and the joints lax. The temperature was normal. The thyreoid gland was easily palpable. The child was bright, happy and affectionate. The speech was at times slow, gutteral and indistinct.

Dr. Hewitt demonstrated the various points of difference between mongolism and cretinism. He pointed out that it was unusual for a cretin to live to the age of twelve years. Twelve months previously the cretin had been given sixteen milligrammes (a quarter of a grain) of thyreoid extract daily and the dose had been gradually increased to six centigrammes (one grain) three times a day. The features had improved and the child had become a little brighter and more refined. In the mongol, on the other hand, thyreoid feeding had had no effect.

DR. LAWRENCE STOKES congratulated Dr. Hewitt on the way in which the cases had been presented. He thought that much bigger doses of thyreoid extract might be given.

Dr. Hewitt replied that larger doses had been tried, but the child had not been so well, although no symptoms of hyperthyreoidism had appeared.

DR. A. E. TAYLOR suggested the giving of thyroxin hypodermically.

### Nævus.

DR. J. LESLIE HENDERSON showed a male, aged seventy-six. A small nævus about the size of half a crown had been present over the left eye at the time of birth. For thirty-five years it had remained stationary and had then begun to grow. In the past twenty-five years it had almost trebled in size. Twenty years previously Mr. Fred. Bird had removed a small portion of the tumour which was interfering with vision. At the time of presentation the nævus was of enormous size, causing great disfigurement.

Dr. Henderson pointed out that the interesting features were the immense size of the nævus and the long latent interval. In his experience if nævi increased in size, they usually did so within two years of birth. He thought that they should be removed widely early in life. In the patient presented surgical treatment was impossible owing to the disfigurement it would cause.

DR. H. FLECKER said that X ray treatment had given good results even in large nævi and there was sometimes little resulting deformity. Early treatment was desirable. In the patient presented the nævus was still increasing in size. It was too extensive for radium to be of much use, but he thought that it might be controlled by deep X ray therapy. The effect of radiotherapy was to cause an obliterative endarteritis, causing the mass to be replaced by new fibrous connective tissue. In small nævi radium applications were quite effective, but Dr. Molesworth had reported excellent results from treatment by X ray therapy.

### Sprengel's Shoulder.

DR. J. J. KELLY showed a boy, aged seven years, who was the third of a family of six children. He had been born after a difficult and delayed breech labour. At the time of birth an elevation of the left shoulder blade had been noticed, which was becoming more pronounced. A skiagram had shown that in addition to being elevated the vertebral border of the scapula was connected to the spine of the seventh cervical vertebra by a bridge of bone.

MR. ALLAN HAILES said that he had seen a similar case in which there had been a bridge of bone connecting the spine of the scapula to the seventh cervical vertebra to which it was united by a false joint. Scapular movement had been quite free. He had also seen a case in which the deformity had been bilateral and one in which there had been an associated hemiatrophy of the face on the same side. He did not think that division of the bridge of bone would be beneficial as the neighbouring muscles were shortened. He thought that the boy would be able to follow an active occupation.

### Bilateral Congenital Cystic Kidneys.

Dr. Kelly also presented a female, aged forty-four years, who for about two and a half years had complained of a heavy feeling in the right side of the abdomen, not sufficient to interfere with her work. In the course of a routine examination a large tumour moving well with respiration and with an irregular surface had been found in the right kidney region. A skiagram taken by Dr. Godby had revealed a very large right kidney shadow, while that on the left side was also larger than normal.

DR. A. NORMAN MCARTHUR said that in 1924 he had operated on the patient for multiple myomata of the uterus. He had at that time, in conformity with his usual practice, explored both kidneys and had found nothing abnormal. He had also seen the patient after the abdominal tumour had been detected. He had referred her to Mr. Maclure who had found that indigo-carmine appeared from the right ureter in four minutes. A ureteral catheter had been passed into the right ureter and some obstruction, the nature of which was not obvious, had been encountered 2·5 centimetres (one inch) from the ureteric orifice. A pyelogram had been taken and no abnormality detected. He agreed with the diagnosis of congenital cystic kidneys.

DR. GODBY referred to a patient with congenital cystic kidneys in whom hæmaturia had been the first symptom. Both kidneys had been found to be enlarged by palpation and X ray examination.

### Acidosis.

At the evening session papers were read by Dr. W. E. Hewitt on "Acidosis in General Practice" (see page 32) and by Dr. J. J. Kellyon on "Gynæcology in Every Day Practice."

DR. VERNON DAVIES said that Dr. Hewitt had given a very full summary of the subject. Although authors of textbooks mentioned acidosis in cyclic vomiting, they did not sufficiently emphasize that an acetone smell in the breath, accompanied by acetone in the urine was very common in children. He had frequently encountered an illness in children of seasonal incidence following the eating of green fruit which presented the following features. The child was usually drowsy, sometimes but often not vomiting, with a high temperature, bowel disturbance either with constipation or diarrhœa, rapid breathing, pain in the abdomen and much acetone in the urine. Rapid recovery usually followed after the administration of alkalis and glucose and suitable bowel treatment. He had also seen children with convulsions and acetone in the breath and urine who rapidly recovered after washing out the bowel with a solution of sodium bicarbonate and the giving of the same drug by the mouth.

DR. W. H. GODBY congratulated Dr. Hewitt on his paper. He thought that alkalosis was commoner than was usually believed. Two years previously he had seen a child with acute pyelitis, in whom large doses of citrate of potash were being administered. The urine had remained acid in reaction. The child had then begun to vomit, the temperature had remained high and then suddenly drowsiness, twitching of the muscles and acute pulmonary œdema had developed. Immediate restorative measures were successful. The citrate had then been omitted and small doses of dilute hydrochloric acid given by the mouth and the child had recovered rapidly from the alkalosis but slowly from the pyelitis. In this case the alkalosis had evidently been due to retention of alkalis as a result of impaired renal function. Hurst had pointed out that the prolonged treatment of ulcer patients by a full Sippy *régime* might be harmful if renal insufficiency were present. Symptoms of acidosis similar to those described by Dr. Hewitt might occur.

DR. D. D. BROWNE said that it was not sufficiently stressed that in some cases of acidosis in children, drowsiness and coma were not present, but the child might be restless or delirious with hallucinations and often convulsions occurred. The temperature and pulse rate might be very high. Rapid recovery usually followed the institution of appropriate treatment. He had seen a breast fed baby three weeks old and also a girl, seventeen years of age, both of whom had become acutely ill and all that could be found on examination was acetone in the urine. In both recovery had rapidly followed the administration of glucose and alkalis. He thought that acidosis was very common and not confined to children between the ages of two and eleven years. The fat metabolism in children seemed to be upset by very trivial causes, such as teething or a sore throat. He had known two children to die rapidly from acidosis and he was awaiting the opportunity to try "Insulin" and glucose in such cases.

DR. LAWRENCE STOKES said that although acidosis was very common, it was not so common in small children and babies as was generally believed. The tests for acetone and diacetic acid were so sensitive that a reaction did not necessarily indicate a clinical acidosis.

In Glasgow very many children had signs of rickets and tetany, especially of a mild degree, was not uncommon, so much so that as a routine all children were tested for Chvostek's sign. A baby twelve months old had been admitted to hospital with signs of a severe toxæmia. Chvostek's sign had been present. After about 150 cubic centimetres (five ounces) of citrated blood had been given, a condition of acute tetany with carpo-pedal spasms had rapidly developed and had been relieved by an intravenous injection of calcium chloride.

DR. J. F. WILKINSON desired to congratulate Dr. Hewitt. They had still a great deal to learn about both so-called acidosis and alkalosis. In so-called diabetic acidosis, which

was probably poisoning by an erratic radicle split off from oxybutyric acid, a clinical sign of great value was diminution of ocular tension. In the treatment of diabetic coma "Insulin" should be given in large doses. In one case 450 units had been given in nine hours with recovery. If the urine were carefully watched, large doses of "Insulin" could be given with safety. In patients with damaged kidneys temporary recovery from coma often occurred, only to be followed by death with symptoms of uræmia.

In post-anæsthetic vomiting, if of the acidosis type with acetone and diacetic acid in the urine, "Insulin" and glucose were of immense value. Fifty grammes of anhydrous glucose in a half litre of normal saline solution should be given intravenously along with thirty units of "Insulin." In severe conditions dealt with by Dr. J. R. Bell the results had been dramatic.

He would like to emphasize the profuse sweating which occurred in some patients with hypoglycæmic coma. He referred to one patient who had previously been seen by him in diabetic coma. Some time after he had again developed coma accompanied by profuse sweating. Within ten minutes after the administration of orange juice the coma had disappeared. It had subsequently been discovered that the patient had taken his usual dose of "Insulin," but not the meal which should have accompanied it. In milder cases of hypoglycæmia confusion of thought and speech were common.

Alkalis should be administered with caution to patients with deficient kidneys and in cases of doubt renal function tests should be done. In hyperchlorhydric patients who did not tolerate alkalis well, he had found "Alocol" to be of value.

All the ketosis in diabetes was not due to disturbances in the fat metabolism. The proteins were partly responsible and he would strongly urge that in all diabetics the intake of protein should be limited to the minimum requirement and should seldom exceed one gramme per kilogram of body weight.

DR. R. F. O'SULLIVAN desired to thank Dr. Hewitt. His paper had provoked a valuable and interesting discussion. He would like to support Dr. Wilkinson in his statements as to the value of "Insulin" and glucose in post-anæsthetic vomiting. In four cases of hysterectomy for uterine fibroids, all in fat, flabby, atonic women, post-anæsthetic vomiting accompanied by acidosis had been rapidly relieved by this treatment, under the supervision of Dr. Bell. He had also seen equally good results in *hyperemesis gravidarum* from the same treatment.

DR. J. W. FLORANCE also desired to thank Dr. Hewitt. His experience of acidosis had been chiefly in connexion with intestinal obstruction. He thought that the information he had gained during the evening would be of value to him in the future.

DR. A. NORMAN MCARTHUR said that post-operative acidosis was of great interest to the surgeon. As a routine practice before operation he had the urine examined for acetone. In many cases even when acetone had been present, the post-operative convalescence had been uneventful. He had seen one patient with severe post-anæsthetic vomiting, in whom the administration of glucose and "Insulin" had not been followed by any dramatic result. He had also seen post-anæsthetic vomiting with a good deal of acetone in the urine of several patients, in whom rapid recovery had followed without the administration of "Insulin." It was a pity that the administration of chloroform was no longer taught. Only a week before ether had been administered by the open method to a woman who was very subject to colds. After the operation she had developed a very serious condition of broncho-pneumonia. Her urine had contained a considerable amount of acetone. With chloroform administration she would have escaped the broncho-penumonia and probably the acetonuria. After an operation he always ordered saline and glucose enemata.

DR. LESLIE HURLEY briefly discussed a few points in the diagnosis and treatment of diabetic coma. There was still a great deal of difference of opinion as to whether alkalis and glucose should be given and opposing views were expressed by eminent authorities in different parts of the world. A few years previously the giving of sodium bicarbonate intravenously had been a routine procedure, but it was generally held to be harmful. He thought, however, that sodium bicarbonate given by the mouth in doses sufficient to make the urine amphoteric was distinctly beneficial. Large doses of alkali given intravenously were harmful and probably converted a condition of acidosis into one of alkalosis.

In diabetic coma the hyperglycæmia could be temporarily disregarded. The main object was to bring about the rapid metabolism of as much glucose as possible, in order to correct the breakdown in the fat metabolism which was the main cause of the patient's symptoms. He therefore thought it wise to give about one and a half grammes of glucose with each unit of "Insulin." This also carried the added benefit of avoiding the risks of hypoglycæmia. In searching the records of the Melbourne Hospital he had found that most of the patients who had recovered from diabetic coma, had received glucose and alkalis in the manner above indicated.

Diabetic coma and uræmic coma might very easily be confused with each other. In diabetic coma the blood urea was usually high, frequently above one hundred milligrammes per hundred cubic centimetres of blood and the urine was usually diminished in amount and contained both albumin and casts, so that a diagnosis of uræmic coma might very easily be made. In diabetic coma, however, in contrast to uræmic coma, the ocular tension and the blood pressure were usually low, the air hunger type of breathing was present and cyanosis was usually absent. If the diagnosis was in doubt the condition should be treated as one of diabetic coma pending further investigations. In uræmic coma the blood sugar was frequently raised and both acetone and diacetic acid might be present in the urine.

## Obituary.

### GEORGE HORNE.

A CONSIDERABLE time has elapsed since the death of George Horne was announced in this journal. It is at times difficult to gather the facts concerning the career of a senior member of the medical profession, as many of the data have to be rediscovered from among a mass of half forgotten things. We were insistent that the record of this distinguished man of science should be accurate and have consented to delay in the publication of these notes rather than that they should be incomplete. George Horne was borne on August 16, 1860, in Brunswick near Melbourne. He was therefore in his sixty-eighth year at the time of his death. His father was the manager of the National Bank of Australasia at Launceston, Tasmania. He attended school at the Carlton College, Melbourne, and at a later date he joined the Hawthorne Grammar School, Melbourne. At the age of fourteen he gained the English, arithmetic and algebra prize at the Carlton College. In the following year he was *dux* in mathematics and again gained a prize in English and also in French. In 1876 he won the first prize in mathematics. He then left the Carlton College and in 1878 he was *dux* of his class at the Hawthorne Grammar School. In the following year he was *dux* of the school. It will thus be seen that his progress through school was one unbroken line of achievement. But while he was a brilliant scholar, he excelled like the Athenian youths of old as an athlete. He won several cups for running and in 1878 he secured a trophy known as the School Cup.

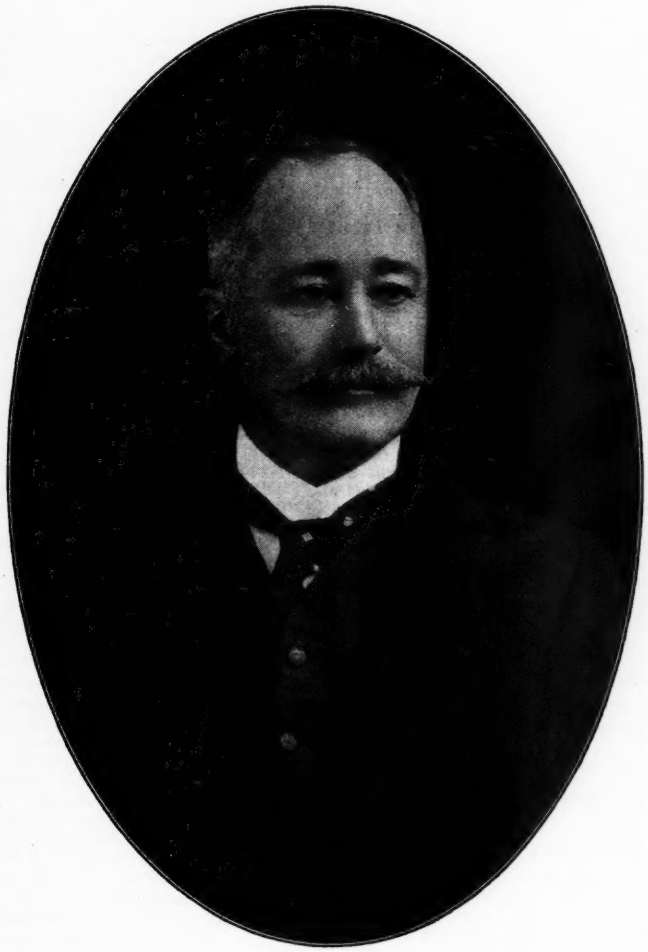
At the age of twenty he entered the Medical School of the University of Melbourne. Dr. Felix Meyer was in his fifth year in 1880, when George Horne entered the school. The year is significant, for Dr. Felix Meyer called a meeting of students and at this meeting the Medical Students' Society was formed. Sir James Barrett, then a third year student, was the first honorary secretary and the original members included Mr. F. D. Bird, Sir George Syme and Dr. A. J. Wood. George Horne joined at an early date. At the end of his first year he took second class honours in his preliminary subjects. In 1882 he gained a scholarship in chemistry, mineralogy, botany, comparative anatomy and zoology and second class

honours. In 1883 he completed his arts course and took first class honours in natural science and gained a scholarship. In February, 1884, he gained third class honours and in October he graduated in medicine and surgery together with Dr. Rothwell Adam, Mr. W. J. Bird, Dr. C. H. Mollison, Dr. Edward Ryan, Dr. N. C. A. Vance and Dr. W. P. Murphy. He was a close associate of the ablest men of his time, was recognized as a scholar and a delightful companion and was a favourite on the field. His fleetness of foot again took him first at the post on several occasions in short and middle distance races. His seniors respected and admired his enthusiasm and his knowledge, while his genial personality and fund of common information gained for him practically universal popularity.

After graduation he entered into partnership with C. J. Daniel, of Clifton Hill. In 1886 he started in practice on his own account at the same place. For several years he worked as a general practitioner, gaining in knowledge and reputation and skill and acquiring expert knowledge, especially in obstetrics and gynæcology.

It is unnecessary to trace his activities in the days of his Clifton Hill practice. His success was proverbial and his popularity immense. What wonder, since this kindly, erudite and skilful man lived for those who trusted him with their health and lives. He was an intense worker, never tiring in his search for knowledge and never content with the knowledge he had acquired. He was a great student of zoology. At Clifton Hill he built a celebrated aviary and in it he succeeded in keeping in captivity such wild Australian birds as the honey eater and the dainty blue wren. In 1902 he obtained the degree of doctor of medicine.

In 1895 he was appointed Honorary Outdoor Infirmary Surgeon at the Women's Hospital. He held this position for nine years at the end of which time he was promoted to the post of Honorary Indoor Infirmary Surgeon. About this time he visited England and when war broke out he immediately joined the Australian Voluntary Hospital. He saw service with this unit in France and attained the rank of Lieutenant-Colonel. In the issue of this journal of June 17, 1916, there is an article by George Horne describing the activities of the Australian Voluntary Hospital, first at Le Havre, then at St. Nazaire on the Bay of Biscay and later at Wimereux, near Boulogne. The first task at the final quarters was the handling of the wounded brought from the first Battle of Ypres. He worked at the hospital until the end of September, 1915, and was then released and returned to Australia. He had relinquished general practice before he left Australia. On his return he devoted his energies to gynæcology and took rooms in Collins Street. He was for a time lecturer and examiner in obstetrics and gynæcology at the University of Melbourne. His textbook "Practical Gynæcology" went through two editions and was practically sold out on both occasions. He had previously joined the Australian Military Forces and had received the V.D. He had commanded the Ambulance Corps before the war. On his return he retained his connexion with the Australian Military Forces and did a considerable amount of work in the examination of recruits for active service abroad. He was a member of the Council of the St. John Ambulance Association and an examiner for that body. He was the founder in Victoria of the St. John Ambulance Brigade and in 1924 he was invested by Lord Stradbroke with the insignia of the Knight of Grace of the Order of St. John of Jerusalem.



As a teacher he gained a deservedly high reputation. He loved his work at the Women's Hospital and in consequence up to the time of his retirement in 1921 at the age of sixty his wards were eagerly sought by students and practitioners.

George Horne was not only an eminent gynæcologist and medical practitioner. He was an ethnologist of world-wide renown. He made a long study of the habits and customs of the Australian aborigines. In close connexion with this he collected a large variety of stone implements, including stone knives, surgical knives, axes, picks, hammers, grinding and throwing stones and throwing and message sticks. He kept these implements in a series of beautiful blackwood cabinets which he presented with their contents in 1926 to the Australian Museum of Natural History. In collaboration with G. Aiston he wrote "Savage Life in Central Australia," a book of record of an expedition to Central Australia in 1923. The book contains the results of his studies of the Australian aborigines.

He was a member of the Council of the Zoological Gardens and was a keen student of ornithology and lover of birds.

In the notes written by two of his intimate friends an impression of his personal characteristics will be found. It is unnecessary for us to enter into greater detail concerning the individuality of this delightful man. He had a very wide circle of friends and was loved by each one. He is survived by his second wife, whose grief must be rendered less acute by the fact that it is shared by so many of his colleagues and friends.

Dr. Allen Robertson writes:

With the passing of Dr. George Horne there is a severing of one of the links between the early surgeons of the Women's Hospital and the staff today of that institution. To many of us he had been a teacher, colleague and friend. His courtesy and kindly manner made him exceedingly

popular amongst house surgeons and junior members of the staff, whom he was always ready to help and advise. He was a clear and enthusiastic instructor and did a great deal to kindle like enthusiasm in all those with whom he was associated. As a medical man he was trusted and beloved by all those on whom he expended his skill and sympathy without distinction.

On his retirement from active connexion with the Women's Hospital after nearly thirty years of service he found pleasure in the study of the aborigines of Australia and especially their weapons. He could never be an idle man and in his early days worked from early dawn until late at night, but this being the attribute of youth, there came a time when he had to hand over to younger men.

Yes, George Horne will be missed by many!

Dr. F. Hobill Cole writes:

An unclouded friendship, rich and rare, extending over nearly forty years, closed in the passing of George Horne on the thirteenth of November and I am left the poorer.

Outstanding features in the character of George Horne were enthusiasm in everything he undertook, physical and mental alertness, untiring patience, mastery of detail and a wide sympathy with all in distress. He excelled in many things, yet was ever modest. Having high ideals he was dauntless and imperturbable. Dr. Horne's tastes were artistic, intellectual and scientific. In a crowded professional life he yet found time to delve deeply into anthropological and ethnological lore and his large collection of aboriginal weapons and stones was unique. This he presented to the Commonwealth.

Ornithology found in him a bird lover and in his well stocked aviaries at Clifton Hill the wildest of the inmates would soon come to perch on his head and shoulders and eat from his hand. In later years it was a pretty sight to see the doctor and his niece feeding the shy little wrens and other small birds in the public gardens.

The life history of George Horne presents a fine record of public service.

## RALPH ALISTER WHITFELD.

THE medical profession is not sufficiently united to be able to realize its loss when a young practitioner is snatched away by a relentless fate at the outset of a promising career, as if death were the retribution for deeds accounted by men as noble. The cold words of an announcement of the death are read by many who have not known of his existence and naturally they awaken no profound emotion. In the death of Ralph Alister Whitfeld the profession has suffered a greater loss than the majority of its members realize.

Ralph Alister Whitfeld was born on September 6, 1895. He was the son of a prominent barrister and the grandson of a very brilliant scholar. He attended the Sydney Grammar School and gave an excellent account of himself throughout his school years. He was exceedingly popular among his mates and everyone had a good word for him. His favourite sport at this time was rifle shooting. In 1912 he obtained the blazer of the Grammar School Rifle Club. In June, 1913, his father died suddenly. He and his father had been intellectual and social companions and the shock of this unexpected tragedy inflicted a deep impression on him. An ordinary boy would have shown signs of loss of control and would have postponed the attempt to pass the leaving certificate (senior) examination. Whitfeld was no ordinary boy. He forced himself to concentrate on his work, despite his heavy grief and he came out with flying colours and an exhibition to boot. This was in November. He entered the University of Sydney in March, 1914, and began his medical studies. Here again he did well, gained the approval and appreciation of his contemporaries and gave evidence of a higher standard of ability than the average. The Great War called him. It was a struggle between the University and other authorities and the junior students of medicine. After a time Whitfeld's insistence won the day. He enlisted in March, 1916, and left Australia with the rank of private attached to the 56th Battalion of the Australian Imperial Forces. He saw much active service with his unit. He was wounded at Bullecourt but recovered fully and was able to rejoin. He obtained promotion and gained non-commissioned rank in the field. At Villers-Bretonneux he again suffered an injury, this time far more serious than before. He was badly gassed. His eyes were attacked and for three weeks he was quite blind. He recovered his sight later, but not completely. In addition his life was endangered by the action of the gas on his lungs. The story of the effect of mustard gas on pulmonary tissue has been told over and over again. Ralph Alister Whitfeld's experience in this respect was not unusual, but was not less horrible than that of other victims of this new instrument of warfare. Again he gained a victory over circumstances. By slow degrees he recovered to a great extent and he remained with his unit until the end of hostilities. He returned to Australia and continued his medical studies in May, 1919. The effect of the excitement, the strain, the hard work, the ghastly accompaniments

of modern war and war injuries on a young man cannot be shaken off in a day. Very many were quite incapable of sufficient concentration to take up serious study immediately on their return and very few had sufficient command of themselves after all the events of that terrible time had passed, to adapt themselves to civil conditions until time, the healer, had wrought a slow change. Whitfeld was different. He had the extraordinary ability of being able to compel himself to do his duty under any circumstances. He worked with zeal and energy and was ready by August, 1922, for his final examination. He passed without difficulty.

After he had taken his degree he spent a year partly as Resident Medical Officer at the Royal Alexandra Hospital for Children and for a short time as *locum tenens* for private practitioners. At the hospital he seized the opportunity to develope his knowledge and to acquire manipulative dexterity. His fingers were always neat and it is certain that had he lived, he would have taken his place among the leading surgeons of his generation. In 1923 he entered into partnership with Dr. F. A. Rodway, of Nowra, New South Wales. Just as his earlier career had been characterized by his popularity with people of all ages, so his life as a general practitioner was notable from the first for the love of his every patient and their appreciation of his worth. He worked remarkably well and proved to his partner within a short time that his *savoire faire* and his soundness as a practitioner rendered him competent to handle the practice by himself. He had apparently recovered his health. He was again able to play tennis and to indulge in fishing. He took a keen interest in the local debating society and other community activities and his help was welcomed and appreciated. His partner was about to leave him in sole charge while he visited the old country, when Whitfeld contracted influenza and as was to be expected in view of the gas injury to his lungs, pulmonary complications set in. After the acute stage of the influenza had passed off, he seemed to be emerging from the grip of his illness and arrangements had been made for him to go into the country to convalesce. But the infection had too secure a hold; pneumonia appeared and with it empyema. He fought for ten weeks and then the end came. It is certain that he would have survived the illness had it not been for the damage inflicted during the war by mustard gas. The sincere sympathy of the medical profession is extended to his relatives, among whom his brother, Dr. S. G. Whitfeld, of Delegate, New South Wales, his mother and his engineer brother may be specially mentioned. Members of the New South Wales Branch of the British Medical Association will also wish to extend their sympathy to his aunt, Miss L. Whitfeld, the Assistant Librarian of the Branch.

A friend and colleague writes:

The passing of Ralph Whitfeld leaves another gap in the comparatively small band of undergraduates who broke into their medical course in order to serve in the great war. The then Dean of the Faculty was strongly opposed to medical students volunteering in the combatant forces.

Whitfeld, like many others, felt that it was a personal problem and his decision led him into the ranks of the Australian infantry. He was present with his unit during some of the worst fighting on the Western Front and was wounded and gassed on more than one occasion.

He returned to Australia after the armistice and took up the threads of his interrupted career which had been dropped about the critical third year period.

Most of his former contemporaries had already qualified and the sense of being "behind" coupled with the overcrowded state of the post-war faculty, did not tend to make the task an easy one.

The fact that he qualified in due course is a tribute to his steady perseverance.

His indifferent health was always a handicap, but he made light of it.

Ralph Whitfeld was beloved by all his friends, his quiet manner concealing a sparkling humour and an appreciation of things worth while.

He gave his best years for his country in the great crisis, and by his untimely death our profession loses a valuable member and our country a worthy son.

# Public Health.

## THE USE OF FOOD PRESERVATIVES.

THE Director-General of Public Health of New South Wales has issued the following statement in regard to the use of preservatives in food.

At the Commonwealth and States of Australia fourth conference on Uniform Standards for Food and Drugs, held in Melbourne in June last, it was recommended that the use of boric acid or any other boron compound as a food preservative be prohibited in Australia on and after July 1, 1928. The health authorities in New South Wales are in agreement with this recommendation and intend to give effect to it at the earliest possible date. This, however, means an alteration of the existing regulations made under the *Pure Food Act* 1908; at the present time the Pure Food Advisory Committee is actively engaged in the revision of the code of regulations and hopes to have it completed and ready for publication early in the new year. The exact date upon which the prohibition will begin to operate is dependent on the date on which the new and amended code is published.

This coincides with the decision of the British Ministry of Health in regard to the presence of the preservative substance in foodstuffs and will have an important bearing on the New South Wales export trade, as foodstuffs preserved with boric acid or any other boron compound will not be admitted into Great Britain on and after the date mentioned.

# University Intelligence.

## THE TEACHING OF BACTERIOLOGY IN MELBOURNE.

THE University of Melbourne is calling for applications for the position of head of its Bacteriological Department. The function of this Department is to teach bacteriology to the students in several of the faculties. Hitherto a great deal of work of examining and reporting on specimens which have been submitted to the Department has been carried out. For this a substantial government subsidy is paid. Fees are also charged for the examination of private specimens. It is desired to reorganize the Department and to secure the assistance of a capable leader who could advise the University authorities concerning the reorganization of the Department on its teaching, reporting and research sides. It has been strongly represented that the position should be converted into a professorship, but this has not yet been decided upon.

# Proceedings of the Australian Medical Boards.

## VICTORIA.

THE undermentioned has been registered under the provisions of Part I of *The Medical Act* 1915, of Victoria, as a duly qualified medical practitioner:

Fiddes, John, M.B., Ch.B., 1919 (Aberdeen), 82, Broadway, Elwood.

Additional diplomas registered:

Frank Robison Kerr, M.D., 1924; D.P.H., 1922 (Melbourne).

Keith Russell Moore, D.P.H., 1927 (Melbourne).

## NEW SOUTH WALES.

THE undermentioned has been registered under the provisions of *The Medical Act*, 1912 and 1915, of New South Wales, as a duly qualified medical practitioner:

Dawson, William Siegfried, M.B., B.Ch., 1916, M.D., 1923 (Univ. Oxford), M.R.C.P. (London), 1920; The University of Sydney.

For additional registration:

Little, Dudley William, D.P.H., 1927 (Univ. Sydney).
Magee, Linda Victoria, D.P.H., 1927 (Univ. Sydney).
Thompson, Roy William, D.P.H., 1927 (Univ. Sydney).

## Books Received.

MOSQUITO SURVEYS: A HANDBOOK FOR ANTI-MALARIAL AND ANTI-MOSQUITO FIELD WORKERS, by Malcolm E. Macgregor. 1927. London: Baillière, Tindall and Cox, Demy 8vo., pp. 282, with illustrations. Price: 15s. net.

AIDS TO THE DIAGNOSIS AND TREATMENT OF DISEASES OF CHILDREN, by John McCaw, M.D. (R.U.I.), L.R.C.P. (Edinburgh), Revised by Frederick M. B. Allen; Sixth Edition; 1927. London: Baillière, Tindall and Cox. Foolscap 8vo., pp. 338. Price: 4s. 6d. net.

EXPOSURES OF LONG BONES AND OTHER SURGICAL METHODS, by Arnold K. Henry, M.B., B.Ch. (Dublin), F.R.C.S.I.; Foreword by Sir W. I. de C. Wheeler; 1927. Bristol: John Wright and Sons, Limited. Royal 8vo., pp. 88, with illustrations. Price: 10s. 6d. net.

## Diary for the Month.

JAN. 16.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JAN. 17.—Tasmanian Branch, B.M.A.: Council.
JAN. 17.—New South Wales Branch, B.M.A.: Ethics Committee; Executive and Finance Committee.
JAN. 18.—Western Medical Association, New South Wales.
JAN. 19.—Victorian Branch, B.M.A.: Council.
JAN. 24.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JAN. 27.—Queensland Branch, B.M.A.: Council.
FEB. 1.—Victorian Branch, B.M.A.: Branch.
FEB. 3.—Queensland Branch, B.M.A.: Branch.
FEB. 7.—Tasmanian Branch, B.M.A.: Council.

## Medical Appointments.

Dr. Henry John Taylor (B.M.A.) has been appointed Acting Government Medical Officer at Townsville and an Acting Health Officer for the purposes of *The Health Acts*, 1900 *to* 1922 and Acting Medical Officer to the State Children Department, Townsville, Queensland.

* * * *

Dr. Herbert Henry Woollard has been appointed Honorary Consulting Anatomist at the Adelaide Hospital, South Australia.

* * * *

Dr. Charles Henry Geoffrey Ramsbotton (B.M.A.) has been appointed an Honorary Assistant Physician at the Adelaide Hospital, South Australia.

* * * *

Dr. Wallis Mervyn Alfred Fletcher (B.M.A.) has been appointed to the Honorary Medical Staff of the Montrose Maternity Hospital, Burwood, New South Wales.

## Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii..

AUSTIN HOSPITAL FOR CHRONIC DISEASES, HEIDELBERG, VICTORIA: Resident Radiologist and Pathologist.
LIDCOMBE STATE HOSPITAL AND HOME, NEW SOUTH WALES: Honorary Ophthalmic Surgeon.
ROYAL ALEXANDRA HOSPITAL FOR CHILDREN, CAMPERDOWN, SYDNEY: Senior Resident Pathologist, Junior Pathologist.
ST. VINCENT'S HOSPITAL, SYDNEY: Honorary Gynæcologist, Honorary Assistant Gynæcologist.
THE ADELAIDE CHILDREN'S HOSPITAL, INCORPORATED: Three Resident Medical Officers.
THE ROYAL SOCIETY: Foulerton Research Professor.
THE UNIVERSITY OF MELBOURNE: Director of Bacteriological Laboratory.

## Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

| BRANCH. | APPOINTMENTS. |
|---|---|
| NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney. | Australian Natives' Association.<br>Ashfield and District Friendly Societies' Dispensary.<br>Balmain United Friendly Societies' Dispensary.<br>Friendly Society Lodges at Casino.<br>Leichhardt and Petersham Dispensary.<br>Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney.<br>Marrickville United Friendly Societies' Dispensary.<br>North Sydney United Friendly Societies.<br>People's Prudential Benefit Society.<br>Phœnix Mutual Provident Society. |
| VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne. | All Institutes or Medical Dispensaries.<br>Australian Prudential Association Proprietary, Limited.<br>Mutual National Provident Club.<br>National Provident Association.<br>Hospital or other appointments outside Victoria. |
| QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane. | Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing.<br>Brisbane United Friendly Society Institute.<br>Stannary Hills Hospital. |
| SOUTH AUSTRALIAN: Secretary, 267, North Terrace, Adelaide. | All Contract Practice Appointments in South Australia.<br>Booleroo Centre Medical Club. |
| WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth. | All Contract Practice Appointments in Western Australia. |
| NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington. | Friendly Society Lodges, Wellington, New Zealand. |

Medical practitioners are requested not to apply for appointments to position at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

## Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

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